

International Society of Fire Service Instructors, Ashland, MA is another resource.

3. *Decontamination.* Decontamination procedures should be tailored to the specific hazards of the site and will vary in complexity, and number of steps, depending on the level of hazard and the employee's exposure to the hazard. Decontamination procedures and PPE decontamination methods will vary depending upon the specific substance, since one procedure or method will not work for all substances. Evaluation of decontamination methods and procedures should be performed, as necessary, to assure that employees are not exposed to hazards by reusing PPE. References in Appendix D may be used for guidance in establishing an effective decontamination program.

4. Emergency response plans. States, along with designated districts within the states, will be developing or have developed emergency response plans. These district and state plans are to be utilized in the emergency response plans called for in this standard. Each employer needs to assure that its emergency response plan is compatible with the local plan. In addition, the CAER program of the Chemical Manufacturers' Association (CMA) is another helpful resource in formulating an effective emergency response plan. Also the current Emergency Response Guidebook from the U.S. Department of Transportation, CMA's CHEMTREC and the Fire Service Emergency Management Handbook should be used as resources as well.

Appendix D—References to Appendix

The following references to the Appendix may be consulted for further information on the subject of this notice:

1. OSHA Instruction DFO CPL 2.70—January 29, 1986, *Special Emphasis Program: Hazardous Waste Sites.*

2. OSHA Instruction DFO CPL 2-2.37A—January 29, 1986, *Technical Assistance and Guidelines for Superfund and Other Hazardous Waste Site Activities.*

3. OSHA Instruction DTS CPL 2.74—January 29, 1986, *Hazardous Waste Activity Form, OSHA 175.*

4. *Hazardous Waste Inspections Reference Manual*, U.S. Department of Labor, Occupational Safety and Health Administration, 1986.

5. Memorandum of Understanding Among the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration, the United States Coast Guard, and the United States Environmental Protection Agency, *Guidance for Worker Protection During Hazardous Waste Site Investigations and Clean-up and Hazardous Substance Emergencies*, December 18, 1980.

6. *National Priorities List*, 1st Edition, October 1984; U.S. Environmental Protection Agency, Revised periodically.

7. *The Decontamination of Response Personnel*, Field Standard Operating Procedures (F.S.O.P.) 7; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, December 1984.

8. *Preparation of a Site Safety Plan*, Field Standard Operating Procedures (F.S.O.P.) 9; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, April 1985.

9. *Standard Operating Safety Guidelines*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response,

Hazardous Response Support Division, Environmental Response Team; November 1984.

10. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), and Environmental Protection Agency (EPA); October 1985.

11. *Protecting Health and Safety at Hazardous Waste Sites: An Overview*, U.S. Environmental Protection Agency, EPA/625/9-85/006; September 1985.

12. *Hazardous Waste Sites and Hazardous Substance Emergencies*, NIOSH Worker Bulletin, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; December 1982.

13. *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide*; U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1984.

14. *Fire Service Emergency Management Handbook*, Federal Emergency Management Agency, Washington, DC, January 1985.

15. *Emergency Response Guidebook*, U.S. Department of Transportation, Washington, DC, 1983.

[FR Doc. 86-28471 Filed 12-18-86; 12:57 am]

BILLING CODE 4510-26-M

Fast Facts

Friday
December 19, 1986

Part V

Department of Labor

Mine Safety and Health Administration

30 CFR Part 57

**Ionizing Radiation Standards for
Underground Metal and Nonmetal Mines;
Proposed Rule**

DEPARTMENT OF LABOR

Mine Safety and Health Administration

30 CFR Part 57

Ionizing Radiation Standards for Underground Metal and Nonmetal Mines

AGENCY: Mine Safety and Health Administration.

ACTION: Proposed rule.

SUMMARY: This proposed rule would revise the Mine Safety and Health Administration's (MSHA) existing standards for ionizing radiation at underground metal and nonmetal mines. The intent of this rulemaking is to improve protection for underground miners with standards that reflect current developments in the principles of radiation protection.

DATE: Comments must be received on or before February 17, 1987.

ADDRESS: Send comments to the Office of Standards, Regulations, and Variances; MSHA; Room 631; Ballston Tower #3; 4015 Wilson Boulevard; Arlington, Virginia 22203.

FOR FURTHER INFORMATION CONTACT: Patricia W. Silvey; Associate Assistant Secretary for Mine Safety and Health; MSHA; (703) 235-1910.

SUPPLEMENTARY INFORMATION:**I. General****A. Background**

Under the Federal Mine Safety and Health Act of 1977 (Mine Act), MSHA is examining its existing regulations for the metal and nonmetal mining industry to ensure that the Agency's standards appropriately address the hazards of ionizing radiation. Ionizing radiation in the metal and nonmetal mining industry includes alpha radiation from the short-lived decay products (daughters) of radon and thoron gases and gamma radiation from radioactive ores.

The existing mining standard for gamma radiation was set at 5 rems in 1977 (42 FR 29418). This level was based on the recommendations first made by the International Commission on Radiological Protection (ICRP) and the National Council on Radiation Protection and Measurements (NCRP) in the mid 1950's.

In 1970, MSHA's predecessor (the Bureau of Mines) established 12 working level months (WLM) as the Federal exposure limit for underground mines. In 1971, the Environmental Protection Agency (EPA) issued Federal radiation protection guidance for radon daughters, which specified a limit of 4 WLM per

year. That annual limit applied to underground mines as a mandatory standard through 30 CFR 57.5042 (then § 57.5-42) which incorporates EPA radon daughter recommendations approved by the President. In 1976, the Mining Enforcement and Safety Administration (MSHA's immediate predecessor) explicitly adopted the current 4 WLM per year limit.

On April 21, 1980, MSHA received a petition requesting an emergency temporary standard to lower the Agency's limits for exposure to radon daughters. MSHA had requested the assistance of the National Institute for Occupational Safety and Health (NIOSH) to review the literature in this area. On July 14, 1980, MSHA received an interim NIOSH study which reviewed selected scientific papers. The study indicated that there is evidence of excess health risk at and below a 120 WLM cumulative lifetime exposure. This cumulative exposure would result from receiving the maximum allowable exposure of 4 WLM per year for each of 30 years. On January 29, 1985, after review of technical literature, scientific studies, and its enforcement experience, MSHA determined that the petition for an emergency temporary standard did not meet the statutory criteria for an emergency temporary standard under section 101(b)(1) of Mine Act and therefore denied the request. However, to ensure that an appropriate level of health protection is being maintained, MSHA published an advance notice of proposed rulemaking (50 FR 4144) requesting comments on the adequacy of the existing standards. On November 19, 1985, MSHA announced the availability of a preproposal draft of revisions to its existing standards (50 FR 47700). Among other responses to these advance notices of proposed rulemaking, MSHA received two documents from NIOSH: "Evaluation of Epidemiologic Studies Examining the Lung Cancer Mortality of Underground Miners" and "Quantitative Risk Assessment of Lung Cancer in U.S. Uranium Miners." In preparing this proposal, MSHA has carefully considered all comments received. The Agency is aware that the National Academy of Science Committee on the Biological Effects of Ionizing Radiation, "BEIR IV," is evaluating the potential health effects associated with internal alpha radiation. When a report becomes available, MSHA will study the applicability of the findings to mining.

NIOSH is developing a recommended standard for protection from radon daughters which will be accompanied by appropriate criteria for its implementation. Once MSHA receives this document, the Agency will solicit

comment on the merits of the recommendations made.

A widely held, basic tenet for minimizing harm from radiation is that exposures to radiation should be kept as low as reasonably achievable (ALARA). Effective implementation of the principle of ALARA involves: education of workers concerning the health risks of exposure to radiation; training in regulatory requirements and procedures to control exposure; establishment of appropriate exposure limits; monitoring, assessment, and reporting of exposure levels and doses; and implementation of radiation control measures.

Several commenters pointed out the need to fully utilize training programs as a means of increasing miners' awareness of the hazards involved. MSHA agrees. The Mine Act specifically provides for training miners in the health and safety aspects of the tasks to which they are assigned. MSHA has specific regulations for training programs in 30 CFR Part 48. At mines where radiation hazards are present, radiation hazard training is an important component of an effective health program. This proposal would put in effect other facets of ALARA by setting requirements for monitoring and recordkeeping to permit assessment of the degree of hazard present and for the implementation of control measures to reduce the hazard.

For the convenience of the mining community, this proposal uses the traditional measurement units of working level (WL), working level month (WLM) and rems. However, conversion to the International System of Units (SI), involving joules and sieverts, can be accomplished with the following conversion factors:

$$1.0 \text{ WL} = 2.08 \times 10^{-5} \text{ J/m}^3$$

$$1.0 \text{ WLM} = 4.33 \times 10^{-3} \text{ J}$$

$$1.0 \text{ rem} = 10 \text{ mSv}$$

B. Summary of Changes

The proposal would apply to underground areas of underground mines. This is consistent with the scope of the existing standards which deal with radon daughters and gamma radiation at underground mines. The proposal would also expand coverage to address the radiation hazard from thoron daughters. The scope of the preproposal draft included X-radiation and the mining and milling of uranium on the surface. However, commenters and MSHA's own field investigations indicate that radiation hazards in these areas are adequately addressed by the Nuclear Regulatory Commission (NRC) and appropriate State agencies.

The most significant departure from the Agency's existing ionizing radiation standards in this proposed rule is the establishment of a combined exposure limit or sum rule for radon daughters, thoron daughters, and gamma radiation. MSHA's existing radiation standards include separate annual limits of 4 working level months (WLM) for radon daughters and 5 rem for gamma radiation. There is no existing mining regulation for thoron daughters. The combined exposure limit would ensure that no miner who is exposed to more than one source of occupational ionizing radiation receives more than the equivalent risk presented by any single source of radiation included in the sum rule. The sum rule would set limits of 4 WLM for radon daughters, 14 WLM for thoron daughters, and 5 rem for gamma radiation.

The preproposal draft would have eliminated the existing ceiling limit of 1.0 working level (WL) for exposure to radon daughters (§ 57.5039) and the requirement for radon gas respirator protection in areas with radon daughter concentrations above 10 WL (§ 57.5046). MSHA agrees with commenters that these ceiling limits aid in keeping exposures as low as reasonably achievable by setting maximum atmospheric concentrations. Accordingly, the proposal includes ceiling limits for radon daughters and thoron daughters. Under the proposal, entry into areas with concentrations of radon daughters above 1.0 WL would require use of approved respiratory protection. A ceiling limit for thoron daughter concentrations would be set at 3.0 WL.

Among other changes to the existing standards, action levels at which exposure records are required would be lowered for certain mines. Posting and access-to-record provisions would be included where appropriate, as provided by the Mine Act. The existing incorporation by reference provisions concerning sampling equipment and procedures (§ 57.5037(a)), record retention (§ 57.5040(b)(4)), and gamma radiation surveys (§ 57.5047(b)) would be deleted. Record retention periods and performance criteria for sampling are included in the proposal. Initial gamma and airborne radiation surveys would be conducted by MSHA.

The preproposal draft would have removed the existing prohibition of smoking during work hours (§ 57.5041). Based on comments received, MSHA has retained a smoking prohibition in this proposed rule.

In the preproposal MSHA requested comment on the appropriateness of setting specific radiation exposure limits

for pregnant workers. Most commenters favored such a provision and the proposal would set a 0.5 rem limit for gamma radiation during the term of pregnancy.

The proposal does not include a provision for medical surveillance. Some commenters suggested that regular sputum cytologic examinations of miners could detect cell abnormalities. However, NIOSH has stated that routine periodic chest X-rays and sputum cytologic examinations do not meet the criteria for a suitable screening test to prevent fatal radiation-induced lung cancer. In fact, lung cancer appears to be an unsuitable occupational disease for medical screening given the current state of knowledge about its early recognition and treatment. To date, there is not convincing evidence that routine periodic medical screening of miners would be an effective means of preventing deaths due to lung cancer. However, the Agency specifically solicits comment on this issue.

The preproposal draft contained a provision to require transfer of miners who exceed annual exposure limits to jobs which would not expose them to additional occupational radiation. Several commenters stated that such a provision would need substantial clarification before it could be effectively implemented. Among the problems cited were the difficulty in assigning a miner to a position where the miner would not be subject to further occupational radiation, in part due to the presence of background radiation at the mine site. Commenters also stated that the proposed exposure limits would keep cumulative exposures below levels where statistically significant risk of material impairment can be projected for an individual miner. In addition, they pointed out that the preproposal draft was based on section 101(a)(7) of the Mine Act which requires transfer, when appropriate, "where a determination is made that a miner may suffer material impairment of health or functional capacity" due to the exposure. The legislative history of the Mine Act indicates that such a transfer should be based on the findings of a medical examination. Given the state of medical surveillance and the nature of the health impairment (cancer), the extent of the benefits that could be derived from a transfer provision are unclear and questions remain as to how such a provision could be effectively implemented. The Agency has not included a transfer provision in the proposal at this time. However, MSHA is concerned that the employment of miners not be adversely affected if they exceed an exposure limit. MSHA

requests suggestions on how a meaningful transfer provision could be structured for such situations and what the impact would be on the mining community.

II. Proposed Annual Exposure Limits

A. Sum Rule

MSHA's existing radon daughter limits are based on the limitation of lung-cancer risks. Radon daughters release primarily low-penetrating alpha radiation and therefore must be inhaled into the respiratory system to have a harmful effect on the body. The Agency's existing gamma limit is based on the prevention of significant risks to the "whole body". Gamma radiation is a penetrating ionizing radiation which can pose a health risk to the entire body.

This proposed rule would set a single annual limit which takes into account the potential for increased cancer risk if there is exposure to more than one source of radiation. The allowable exposure to any one type of radiation would be dependent on the concurrent annual exposure to the other types of radiation. The proposal uses the International Commission on Radiological Protection's concept of "effective-dose equivalents" which treats radiation doses from different types of radiation exposure in terms of equivalent fatal cancer risks as if the risks were due to uniform whole-body gamma exposure (ICRP Publication 26 "Recommendations of the International Commission of Radiological Protection", 1977). The guiding principle is that the total risk of radiation-induced fatal cancers for an individual should be limited.

The need and desirability for summation of doses to determine total risk has been recognized by the ICRP since 1959 (see ICRP Publication 2, "Report of Committee II on Permissible Dose from Internal Radiation", 1959). ICRP Publication 26 introduced the "effective-dose equivalent" concept to permit combining internal and external exposures. The Environmental Protection Agency (EPA), in its draft Federal radiation guidance, and the Nuclear Regulatory Commission, in its proposed revisions to Part 20 of the Code of Federal Regulations (51 FR 1092; January 9, 1986) propose adoption of ICRP's concept of summation of doses. ICRP specifically recommends this approach for mining in its Publication 32 "Limits for Inhalation of Radon Daughters" (1982) and Publication 47 "Radiation Protection of Workers in Mines" (1985). MSHA also believes that

this approach is appropriate for the mining industry.

The combined limit (sum rule) proposed by MSHA is simplified from that used by the ICRP and NRC because only a few sources of radioactivity are present in underground mining (principally, radon daughters, thoron daughters, and gamma radiation). This combined exposure concept would provide equivalent protection for miners regardless of the ionizing radiation source. Under the sum rule, uranium miners, who receive both radon-daughter and gamma exposures, would not be permitted to receive a higher radiation risk than non-uranium miners, who receive little or no gamma radiation.

While there is a range of scientific opinion on the equivalence of rems to WLM's, MSHA has developed its proposal from ICRP's estimates that a 4.8 WLM radon daughter exposure per year and a 5 rem gamma dose per year present approximately equivalent fatal cancer risks. According to ICRP, an annual exposure to both 4.8 WLM of radon daughters and 5 rem of gamma radiation nearly doubles the risk of fatal cancer from either type of radiation exposure alone.

The ICRP combined limit recommendation allows an annual exposure to 4.8 WLM of radon daughters so long as there is no contribution from long-lived radionuclides, thoron daughters, or gamma or X-radiation. This recommendation for radon daughters recognizes that the lung cancer risk derived from epidemiologic studies of uranium miners includes the excess lung cancer risk from external gamma radiation, long-lived radionuclides, and other carcinogenic agents to which the miners may have been exposed. Canadian, French, and U.S. data indicate that long-lived radionuclides can account for up to approximately 20 percent of the airborne radiation exposure of miners. Therefore, MSHA proposes to include in its sum rule a limit of 4 WLM for radon daughters rather than 4.8 WLM to compensate for the presence of long-lived radionuclides and eliminate the necessity to sample and keep exposure records for them. The 4 WLM per year limit is also consistent with the current Federal radiation protection guidance for occupational exposure (36 FR 12921, July 9, 1971).

Based on the ICRP recommendations (Publications 32 and 47) and consistent with NRC's recent proposed rule, the MSHA's proposed limit for thoron daughters in the sum rule is 14 WLM. The proposed limit for gamma radiation is 5 rem, consistent with MSHA's

existing limit for gamma radiation as well as with NRC, EPA, and Federal radiation protection guidelines.

B. Degree of Risk

Considerable evidence from epidemiologic studies relates cumulative exposures to radon daughters of greater than 100 WLM to an increased risk of lung cancer. Although some studies indicate that exposure to less than 100 WLM increases the risk of lung cancer, these data are less conclusive. Much of the data of the principal epidemiologic studies were derived from miner exposures during the 1940's and 1950's when the poor ventilation of mines resulted in high cumulative exposures, many over several hundred WLM. However, relatively few data are available for defining the effect of exposure at occupational levels typically experienced in the mining industry today.

Because the data on low cumulative exposures are too sparse to allow risk to be estimated directly, statistical modeling based on available epidemiologic data must be used to estimate risk. Such statistical models, however, are intended to show correlation, not necessarily causation. There continues to be divided opinion in the scientific community on which statistical model to use or even whether to extrapolate from the observed effects at high exposures to the probable effects at low exposures.

Each of the epidemiologic studies currently available has inherent deficiencies. For example, most studies of miners have involved relatively small populations. However, because the frequency of lung cancer is not relatively high, an analysis of the mathematical relation between exposure and incidence indicates the need for the study of sizable populations. Even when the overall number of miners in a study group is relatively large, the numbers in many subgroups (for example, nonsmokers) is often too small to effectively evaluate the many confounding variables which affect the group.

Epidemiologic studies are further complicated by uncertainties about the amount of the radon daughter exposure received by individuals. There is a lengthy latency period between the occupational exposure and the appearance of cancer. Frequently, studies attempt to reconstruct an individual miner's exposure from an annual average radon daughter exposure estimate for a particular mine or mine area. Thus, the individual's actual exposure could vary greatly from the estimated exposure. In the

preproposal draft, MSHA relied in part on the study of the Swedish Malmberget iron miners. The Agency received extensive comments from two commenters who recently traveled to Sweden to consult with several individuals knowledgeable about the study. These commenters concluded that the risk estimates of the Malmberget study are unreliable because of uncertainties about past exposures.

MSHA also relied on a study of Ontario uranium miners in the preproposal draft. According to NIOSH, this study also has three limitations. First, the group has had only about 18 years of follow-up. The median attained age of the miners was 39 years in 1977. A short follow-up on a young group creates uncertainties because lung cancer is rarely manifested before age 40. Second, thoron daughters and gamma radiation levels sometimes occur at high levels in the Ontario mines, although the effect is a highly variable factor. Finally, the researchers' risk assessment failed to consider smoking. Out of a group of 57 uranium miners who died of lung cancer, only one was a nonsmoker; the rest smoked. Although correction for smoking may not substantively change the Ontario risk assessments, NIOSH has recommended that definitive conclusions regarding this study await a smoking history analysis.

For this proposal, MSHA has reassessed the available epidemiologic evidence and has concluded that the U.S. Public Health Service study of Colorado Plateau miners and a study of Czechoslovakian miners by Sevc *et al.* are the most appropriate epidemiologic studies for assessment of radon daughter risk to U.S. miners. These studies incorporate a relatively large number of exposure measurements, detail individual information such as smoking habits and age at first exposure, and document followups. The Colorado Plateau study shows no statistically significant excess lung cancers below 120 WLM (BEIR III, 1980). In the Czech study, statistically significant differences between observed and expected cases of lung cancer emerged in the 100-149 WLM range and above (Sevc, Kunz, Placek, 1976). In reviewing available epidemiologic studies, the National Council on Radiation Protection and Measurements (NCRP) has stated that no study, so far, has produced data which show a statistically significant excess of lung cancer in the lowest exposure category of below 60 WLM (NCRP Report No. 78: Evaluation of Occupational and Environmental

Exposures to Radon and Radon Daughters in the United States, 1984). Based on available 1984 data reported to MSHA by mine operators for 1528 uranium miners, the cumulative exposure of most of these miners was well below 60 WLM. The highest cumulative exposure reported was 70 WLM.

The lack of low level exposure-response data, however, does not exclude the possibility of an exposure threshold below which radiation will have no effect. Until such time as it becomes known what the exposure-response relationship at low levels is, it is prudent to assume a non-threshold linear relationship for low cumulative radon daughter exposures. Since the adoption of a 4 WLM radon daughter standard for mining in 1971, a number of risk assessments using this assumption have been completed and arrive at comparable estimates of lifetime risks per unit of dose: the BEIR I and III reports of the National Academy of Sciences (1972 and 1980) and studies by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR, 1977 and 1982), ICRP, NCRP, and the EPA. Based on these assessments, MSHA estimates the lifetime risk of fatal lung cancer to range from 1 to 6 cases per 10,000 miners per WLM. ICRP's estimate of risk is 1.7×10^{-4} and NCRP's estimate is 1.5×10^{-4} .

In February 1985, NIOSH submitted to MSHA a quantitative risk assessment of lung cancer in uranium miners in the United States. The report presented a statistical assessment of mortality from lung cancer among white male uranium miners working in the Colorado Plateau. For cumulative occupational exposures over a period of 30 years, the NIOSH study estimated a relative risk of 1.42 at an annual level of 1 WLM, 1.66 at 2 WLM, 1.88 at 3 WLM, and 2.07 at 4 WLM. Using this risk assessment, miners exposed to 4 WLM per year for 30 years would be projected to have slightly more than twice the normal risk of lung cancer. However, it should be noted that the mean cumulative exposure of the Colorado Plateau group was 821 WLM and the median exposure 430, considerably higher than the exposures experienced today. NIOSH states that their model provides a good fit to the data in the range of 60 to 6000 cumulative WLM. However, the existing radon daughter standard would allow no more than 120 cumulative WLM over a 30-year working life. As noted, the actual cumulative exposure of working U.S. uranium miners is considerably below 100 WLM. One commenter noted

that NIOSH's choice of mathematical functions to resolve the problem of the small number effect in the study results in a risk model that is "very ill behaved as doses get smaller and smaller (Hamilton, Brookhaven National Laboratory)."

In an evaluation of risk of death or disability due to radon daughter exposure, the presence of other work place hazards must be recognized in order to allocate resources in a manner that optimizes the protection afforded to miners from all hazards. To put the risk of radiation into perspective, ICRP judged the acceptable level of occupational risk by comparing risk from exposure to radiation to risk in industries that do not involve radiation and which are recognized as having high standards of safety, ICRP Publication 27 (1977) and Publication 32 (1981). "Safe" industries were considered to be those having an average annual risk of fatal accident due to occupational hazards of 1×10^{-4} . This corresponds to a lifetime risk of occupation-related death of about 0.5 percent for 50 years of employment. However, mining industry data indicate that the majority of miners work no more than 10 years in underground uranium mines (Beverly 1981, Waxweiler 1981) where the highest radiation exposures in mining occur. NCRP has reported that if the limit of 4 WLM per year is observed, then the average exposure should be considerably less and the 4 WLM limit can be considered to be consistent with the 0.5 percent risk for 10 years of exposure. Actual annual average exposures in U.S. uranium mines are presently reported to be between 1 and 2 WLM per year (NCRP Report No. 78).

Given the current data from epidemiologic studies, the various risk assessments based on that data, the relatively short period of time most uranium miners work underground, the exposures of current-day miners, and the effect of the proposed sum rule on lowering exposure to radon daughters, MSHA believes that an annual limit based on 4 WLM is still appropriate. However, the Agency is considering setting a cumulative occupational exposure limit for radon daughters. Such a limit should ensure that an individual's cumulative occupational exposure would remain well below the levels at which excess lung cancer has been demonstrated. The Agency requests comments on the practicality and necessity of setting a cumulative limit, including data on the level this limit should be.

III. Section-by-Section Discussion

Section 57.5000 Definitions.

The proposal would include two definitions, "working level" and "working level month," which would appear at the beginning of Subpart D. These terms define units of measurement for the potential alpha radiation released by radon daughters and thoron daughters. The preproposal draft suggested changing the existing 173-hour work month to a 170-hour month for consistency with the NRC, NIOSH, and ICRP and to bring the U.S. mining industry under an internationally accepted standard for future epidemiologic studies. However, several commenters stated that the modification would only further limit exposures to radon daughters with little concurrent benefit to miners. They stated that a change would unnecessarily complicate calculations in epidemiologic studies. The proposed rule would retain the existing 173-hour work month.

Section 57.5700 Scope.

As with the existing radiation standards, the proposal would apply only to metal and nonmetal underground mines. The statement of scope would clarify that the standards apply to "occupational" exposure to ionizing radiation. Radiation exposure for medical reasons or environmental exposure would not be a factor in computing the exposure received at the mine. Under the preproposal draft, the radiation standards would have applied to underground areas of underground mines, the mining or milling of uranium on the surface, and the use of X-radiation equipment. MSHA is proposing to limit the scope to underground mines for several reasons. Exposure to radiation at uranium mills is already regulated by NRC. MSHA has a memorandum of understanding with NRC in this regard (45 FR 1315; January 4, 1980). Based on field experience and data, other surface areas have only minimal airborne radiation hazards. During the preproposal phase of this rulemaking, the Agency conducted a partial survey of surface operations to determine potential hazards from ionizing radiation. MSHA found no significant radiation hazard at surface operations which was not already adequately addressed by other State or Federal agencies. MSHA has not included coverage of X-radiation equipment in the proposed standard. Although X-radiation equipment is frequently used in laboratories at metal mines and cement plants as an analytical tool, commenters pointed out

that exposures from these types of equipment are usually low, isolated to specific parts of the body, and adequately regulated by State and local government agencies. The standards would not apply to radioactive sources, such as nuclear gauges, which are regulated by the Nuclear Regulatory Commission.

The proposed rule would also directly address for the first time exposure to thoron daughters in mines. Although no active mines in the United States presently have reported significant levels of thoron daughters, such levels have been found in U.S. mines which are now inactive. Therefore, MSHA believes that it is prudent to address the potential hazard and requests data on the thoron daughter levels in mines operating today. However, monitoring and recordkeeping would only be necessary when thoron daughter concentrations exceed the proposed action levels.

Section 57.5701 Control of exposure to radiation.

This section would revise §§ 57.5038, 57.5042, and 57.5047(d) which concern exposure limits for ionizing radiation. The proposal adopts a calendar-year exposure limit which combines exposure to radon daughters, thoron daughters, and gamma radiation and retains the existing ceiling limit for radon daughters. It does not contain the provision for a 3-year, 8 WLM cumulative radon daughter limit contained in the preproposal draft. Commenters generally stated that such an approach had little merit as a means of controlling exposure.

The preproposal draft would have eliminated the existing ceiling limit of 1.0 WL for exposure to radon daughters (§ 57.5039) and the requirement for additional protection against radon gas in areas with a radon daughter concentration above 10 WL (§ 57.5046). Most commenters stated that the provisions should be retained. After reviewing these comments, the Agency agrees that the ceiling limits are an important element in an overall radiation control program designed to keep exposures as low as reasonably achievable.

The proposed rule would prohibit any person from being exposed to air containing concentrations of radon daughters exceeding 1.0 WL or thoron daughters exceeding 3.0 WL unless wearing approved respiratory protection. Areas in which radon daughter concentrations are above 1.0 WL or thoron daughter levels are above 3.0 WL would have to be barricaded or posted to prohibit entry without

respiratory protection. The barricading or posting requirement revises existing § 57.5045 and is intended to notify workers of the hazard of entering such areas without appropriate protection. If radon daughter concentrations exceed 10 WL, supplied-air respiratory protection would be required to protect against radon gas. Supplied-air respirators are necessary to protect workers from radon gas which cannot be removed by filter-type respirators.

The proposal would require mine operators to maintain exposures of all persons within permissible limits by the use of feasible engineering and administrative controls. Respiratory protection would have to be used when controls cannot reduce exposures to these levels. The principal means of controlling exposure are ventilation for radon daughters and thoron daughters and shielding or avoidance for gamma radiation. Administrative controls may also be used and most often entail rotation of personnel from areas of higher exposure to areas of lower exposure. The net effect of administrative controls alone would be a reduction of individual exposures but no reduction in the overall exposure of the work force. However, a combination of engineering controls, administrative controls, and other efforts to keep exposures as low as reasonably achievable is most typically used in the mining industry and has proven effective in recent years.

The Agency is reviewing its overall policy concerning methods of compliance for its health standards. However, MSHA wishes to limit comment in this rulemaking to the appropriateness of the proposed means of radiation control and to other radiation controls which could provide the necessary protection. The broader health issues involved in the Agency's overall policy on means of control are under review within the Department in the context of other rulemaking proceedings which will provide a more appropriate forum for comment. The final rule for ionizing radiation will be based on the comments submitted in this rulemaking and will reflect, to the extent possible, the Agency's overall policy review on means of control. The Agency will assure that the affected mining community will be provided with an adequate opportunity for comment on any subsequent policy decision which may affect relevant issues in this rulemaking.

Ventilation carrying needed fresh air into the workings of an underground mine is often the most effective means to limit the inhalation of airborne radiation. When additional steps are

necessary, existing technology is readily available. Airborne radiation concentrations can be reduced by supplementing the air flow to increase dilution or using bulkheads to seal inactive areas. However, MSHA recognizes that some areas with elevated levels of airborne radiation must be entered on a short-term basis for the purposes of inspection, maintenance, or installation of controls. In these cases, respirators would have to be used. The standard would allow adjustment of exposure records to credit the protection provided by respirators during these short-term uses and when needed to supplement engineering and administrative controls.

There are limitations, however, when the use of respirators would result in the adjustment of exposure records. The process of extracting ore underground involves a high degree of physical exertion. A miner wearing an otherwise effective respirator may remove it at times to compensate for the additional effort that breathing through a respirator entails. This is particularly true when the respirator must be worn for long periods of time. Accordingly, under the proposal, adjustment of exposure records would not be routinely allowed. Further, respirators do not provide protection from gamma radiation; no adjustment would be allowed for gamma records. The respirators would have to be approved under 30 CFR Part 11 and used in accordance with the respiratory protection program requirements of § 57.5005(b). MSHA solicits comments on whether there are additional circumstances where respiratory protective equipment may provide the necessary protection.

As provided by section 103(c) of the Mine Act, the standard would require the mine operator to notify overexposed miners of their overexposure and the corrective action to be taken.

In the preproposal draft, MSHA requested comments on the appropriateness of a provision for limiting gamma radiation exposure during pregnancy. Commenters supported such a provision. The proposal would set a limit of 0.5 rem for women who inform the mine operator of their pregnancy. It is unclear how much shielding the mother's body provides the embryo or fetus, so MSHA is proposing a limit on the whole body dose to the mother.

The 0.5 rem limit proposed for the duration of the pregnancy is based on EPA's proposed radiation protection guidance and is consistent with NRC's January 9, 1986 proposed rule. If the occupational whole-body gamma dose

of the pregnant woman has exceeded 0.5 rem between the estimated date of conception and the declaration of pregnancy to the mine operator, the woman would be prohibited from receiving an additional occupational whole-body gamma dose exceeding 0.05 rem during the remainder of the pregnancy.

Section 57.5702 Monitoring for airborne radiation.

This section would replace § 57.5037 and concerns monitoring for the presence of radon daughters and thoron daughters to determine exposures. It contains provisions for when, where, and how to measure these forms of airborne radiation.

It would replace an incorporation by reference of American National Standards requirements for sampling equipment and procedures (ANSI N13.8—1973) with a performance-oriented provision based on accuracy. These criteria reflect existing technology, allow the use of present methods of sampling, including the instant working level meter, and would permit the use of new methods of monitoring. They reflect the accuracy criteria for exposure estimates set forth in ANSI N13.8—1973, "Radiation Protection in Uranium Mines," paragraph 8.2. MSHA solicits comment on the accuracy and applicability of individual alpha dosimetry for radon daughters and thoron daughters.

The proposal would require that sampling be conducted in areas representative of exposures. Sampling or measuring would have to be done by a person trained or experienced in these tasks. Consistent with section 103(c) of the Mine Act, the proposal would allow miners or their representatives to observe the sampling and measuring used to determine their exposures.

Unlike the existing standard, MSHA would not require screening of all underground mines for the presence of radon daughters or gamma radiation or periodic screening of mines with radon daughter concentrations below 0.10 WL. The Agency currently does this screening and would continue to do so to ensure that mines with potential radiation hazards, including thoron daughters, are identified.

To monitor airborne radiation exposure at mines, MSHA would require sampling when concentrations of radon daughters exceed 0.2 WL or concentrations of thoron daughters exceed 0.6 WL. These action levels were derived by determining the average concentration which over the course of a year would exceed 30 percent of the annual limit and allowing approximately

two standard deviations above the average to allow for fluctuation in levels and measurement (Schiager, *et al.*, "Radiation Monitoring for Uranium Mines: Evaluation and Optimization," 1981). ICRP recommends and NRC has proposed to require that all individuals who are likely to exceed 30 percent of their allowable annual limit be monitored.

When initially found, areas with concentrations of radon daughters and thoron daughters that exceed the action level but are promptly reduced and maintained below that level would not be required to be sampled periodically. Also, if areas above the action levels are posted against entry without respiratory protection or barricaded, there is no need for periodic monitoring to determine personal exposures unless miners enter the areas.

Sampling would be required initially on a weekly basis to ensure the accuracy of the exposure records. Under the proposal, the weekly sampling action level for radon daughters would be 0.20 WL. Under the existing rule, the action level for weekly sampling is 0.30 WL. The action level for thoron daughters would be 0.60 WL based on the risk ratio between radon daughters and thoron daughters used by the ICRP.

Areas with concentrations of 0.20 WL or less radon daughters or 0.60 WL or less thoron daughters which are entered by miners who are exposed to levels above 0.20 WL (or 0.60 WL, as appropriate) elsewhere in the mine would also have to be sampled. When records are kept for a miner, sampling becomes necessary in areas with concentrations less than the action level to account for all exposures received. Otherwise, the miner could be overexposed in the course of the year without an indication of the overexposure. The Agency, however, realizes that some areas may have such low concentrations that additional exposure in these areas may be minimal. MSHA requests comments on the level at which sampling in such areas should not be necessary.

Under the proposed rule, weekly sampling frequency may be changed to monthly and remain monthly in an area so long as the lowest and highest results of the last 4 samples (weekly or monthly) differ no more than 0.12 WL. Monthly sampling frequency may be changed to quarterly and remain quarterly in an area so long as the lowest and highest results of the last 4 samples (monthly or quarterly) in that area differ no more than 0.09 WL. If the range of the last 4 samples is more than 0.12 WL or 0.09 WL, sampling frequencies would have to revert to the

original frequencies. MSHA has calculated that, if the range is 0.12 or less for monthly, or 0.09 or less for quarterly, there is 95 percent confidence that the concentration variation in the area is within the accuracy necessary to meet the exposure record criteria set out in ANSI N13.8—1973 for 4 WLM. The ANSI criteria ensure that annual individual exposure records have an accuracy of ± 50 percent at the 95 percent confidence level. These provisions recognize that under some circumstances radon-daughter and thoron-daughter concentrations may remain relatively constant. This may occur in haulageways or intake airways where the incoming air is very effective in diluting concentrations or where the release of radon or thoron from the surrounding strata may be relatively constant. MSHA believes that longer intervals between sampling times should be allowed when sample results are uniform, since the accuracy of the exposure record would still be ensured.

Section 57.5703 Measurement of gamma radiation.

This section would revise § 57.5047 by requiring the mine operator to provide individual gamma radiation dosimeters for all persons whose whole-body dose to gamma radiation exceeds an average of 0.75 millirem per hour during any shift (typically an 8-hour period). This action level would prevent any miner from exceeding more than 30 percent of the allowable exposure without a record of the exposure being maintained. Because the fetus is more sensitive to gamma radiation, the action level for women who have informed the mine operator of their pregnancy would be 0.33 millirem per hour during any shift, based on the 0.5 rem allowable limit for the 9 months of the pregnancy. MSHA particularly solicits comments on the appropriateness of these action levels.

MSHA has not adopted NRC's approach of requiring dosimeters for individuals who could be expected to receive over 0.5 rem on an annual basis. The levels of natural gamma radiation encountered in mining can be expected to fluctuate more than those in controlled environments such as power plants and laboratories. MSHA believes that it is more prudent to set an action level based on the radiation received during any shift, rather than on that which could be received over the course of a year.

Section 57.5704 Records.

This section would revise §§ 57.5040 and 57.5047(c). For radon daughters, it would require that records be kept for

any person entering areas where radon daughter concentrations exceed 0.20 WL when gamma dosimetry is required for that person or 0.30 WL when gamma dosimetry is not required. If radon daughter records are kept for an individual, then the individual's exposure to concentrations less than these levels would also have to be recorded to ensure that the exposure limits are not exceeded. Currently, complete individual exposure records must be kept for all underground uranium mines, and for other underground mines at an action level of 0.30 WL. In most instances, the proposed action levels would provide a record of exposures that could result in an overexposure under the sum rule.

Under the proposed combined exposure limit, exposure to alpha and gamma radiations are summed together. MSHA is proposing two levels for radon daughter recordkeeping based on the level of gamma radiation present. If the level of gamma radiation is sufficiently high that dosimetry is necessary, then exposure to radon daughters above 0.2 WL could result in an individual's total exposure exceeding the combined exposure limit. If gamma levels are below that requiring dosimetry, exposure to slightly higher levels of radon daughters would be required to exceed the combined exposure limit, and therefore a level of 0.3 WL is proposed for such instances. Since non-uranium mines are likely to have a lower level of gamma radiation present than uranium mines, the 0.3 WL level would tend to apply most often in nonuranium mines. As a practical matter, these levels would also provide guidance to the operator in maintaining exposures as low as reasonably achievable. The action level for thoron daughter exposure records would be set at 0.60 WL.

As stated, § 57.5703 would require that individual gamma dosimeters be provided to miners whose average exposure to gamma radiation would exceed 0.75 millirem per hour during any shift (0.33 millirem per hour during pregnancy). The dosimetry results would be used to maintain individual calendar-year records and in determining compliance with the proposed combined exposure limit. Currently, gamma exposure dosimeters and records are required at an action level of 2.0 milliroentgens per hour. The proposal is based on an average shift dose (rems per hour) rather than a rate derived from instantaneous readings. Thus, it would allow short term excursions in high exposure rate areas without recordkeeping as long as the average

dose rate during any shift does not exceed 0.75 millirem per hour (0.33 millirem per hour during pregnancy).

The proposal would change the existing requirement that exposure records be updated yearly to a requirement that individual exposure records for gamma and airborne radiation be updated within 60 days of the end of each calendar quarter. Under the sum rule, such periodic updating is necessary to ensure that the mine operator is aware of potential overexposures and can make appropriate changes in a timely manner. Updating exposure records would also assist the mine operator in maintaining exposures as low as is reasonably achievable. The Agency requests comments on the impact of this recordkeeping change.

This section provides for the discontinuance of individual exposure records for radon daughters or thoron daughters when a miner is no longer exposed to levels exceeding 0.20 WL for radon daughters or 0.60 WL for thoron daughters, as appropriate, for 4 consecutive weeks or more and the miner's prorated calendar year exposure falls below 30 percent of the prorated annual limit. For purposes of discontinuing recordkeeping, 30 percent of the prorated annual limit for radon daughters would be determined by multiplying the number of months of recorded exposure by 1/10 of a WLM; for thoron daughters, the number of months of recorded exposure would be multiplied by 3/10 of a WLM.

Except during pregnancy, gamma dosimetry may be discontinued for a person who is no longer exposed to an average of 0.75 millirem per hour during any shift provided that the person's calendar year dose has not exceeded 125 millirems multiplied by the number of months of recorded dose in that calendar year. This provision would ensure that gamma dosimetry is not discontinued unless the individual's prorated dose falls below 30 percent of the annual gamma limit.

This section would also provide for access to records and add a provision to require exposure records to be provided to the miner upon termination of employment. This provision assists miners in supplying future employers with a record of their past exposures. MSHA believes that these provisions reflect the intent of the access provisions of section 103(c) of the Mine Act.

The existing standard, through an incorporation by reference of paragraph 9.8 of ANSI N13.8—1973, requires that radon daughter exposure records for an

individual be kept until the individual is 75 years of age or until 10 years after the known death of the individual. There is no retention period for gamma records. The proposed rule would require that all sampling data, individual occupancy records, and combined exposure records be retained at the mine or the nearest mine office for one calendar year past the calendar year to which they pertain. Copies of records would no longer have to be sent to MSHA or kept on an approved form, but would have to be made available to MSHA for examination. Under section 103(h) of the Mine Act, NIOSH may request such records for medical research.

Some commenters stated that the record retention should remain the same as the present requirement, in part to allow for future epidemiologic study. The Agency requests comment on the utility of a longer record retention period: in particular who should retain such records, the potential uses for such records, and the costs involved with a longer period of retention.

Section 57.5705 Calculation of exposure to individuals.

This section clarifies the methodology for calculating individual radon daughter exposures in existing § 57.5040 and contains provisions for calculating exposure to thoron daughters.

A new provision would allow adjustments in calculating individual exposures if approved respiratory protection is worn on a short-term basis for inspection, maintenance, or installation of controls or when needed to supplement engineering and administrative controls. Although levels of airborne radiation may exceed ceiling limits during these activities, respirator credit is allowed because of the limited time of exposure and nature of the tasks. The adjustments proposed for each type of respirator are based on the degree of protection provided by the respirator when properly used. Positive-pressure supplied-air respirators and pressure-demand self-contained respirators furnish full protection if radon-free air is used. Air-purifying (negative-pressure) respirators are less effective because of inward leakage inherent to such respirators. The preproposal draft contained a provision for canister-type respirators for protection against radon. However, no canister-type respirators for radon have been approved to date. MSHA solicits comments on the appropriateness of an allowance for these types of respirators.

Section 57.5706 Smoking prohibition.

The preproposal draft would have deleted the existing requirement in § 57.5041 prohibiting smoking in all areas of a mine for which radon daughter exposure records are required. Most commenters indicated that removing the smoking prohibition would be a step back from sound health protection. Therefore, in the absence of evidence of the exact relationship of smoking to radiation-induced lung cancer, the proposed rule would ban smoking underground in any mine where airborne radiation exposure is sufficiently high so that it is necessary to maintain records of the exposure.

IV. Executive Order 12291 and Regulatory Flexibility Act

Under Executive Order 12291, MSHA has prepared an initial analysis to identify potential costs and benefits associated with proposed changes to its ionizing radiation standards for underground metal and nonmetal mines. The Agency has incorporated this analysis into the Initial Regulatory Flexibility Analysis required by the Regulatory Flexibility Act. MSHA has determined that the proposed rule would not result in major cost increases nor have an incremental effect of \$100 million or more on the economy. The proposed rule does not meet the criteria for a major rule and therefore a Regulatory Impact Analysis is not necessary.

The Regulatory Flexibility Act requires that in developing regulatory proposals, agencies should evaluate and include, wherever possible, compliance alternatives that minimize any adverse impact on small business entities. The Mine Act mandates the promulgation of mandatory standards dealing with toxic substances and harmful physical agents which may affect the health or functional capacity of miners. The proposed rule would clarify the compliance responsibilities of mine operators in regard to protecting miners from ionizing radiation exposures. Where possible, MSHA has proposed performance-oriented language to enable the mine operator to implement the most flexible and least costly compliance methods. MSHA has eliminated the requirement to send annual reports showing individual miner's cumulative exposures and has allowed adjustments to the cumulative exposures for use of respirators during short-term assignments in areas above the ceiling limits and when necessary to supplement engineering controls. In this way, MSHA has taken into consideration the needs of small mines.

In the following summary of the Initial Regulatory Flexibility Analysis, MSHA has compared the costs and benefits associated with the proposed changes with the costs of existing requirements. A copy of the analysis is available upon request.

Both the existing and proposed ionizing radiation standards apply to all underground metal and nonmetal mines within MSHA's jurisdiction that contain levels of radon daughters or gamma radiation above specified action levels. The proposed rule would also address the presence of radiation from thoron daughters when action levels are exceeded.

Although metal and nonmetal mining in the United States is a diverse industry producing about 55 different mineral commodities, the primary focus of the existing and proposed rules is underground uranium mines. The underground uranium mining industry has undergone substantial changes in recent years due to declining demand and competition from low-cost foreign sources. The total number of underground mines fell from a peak of 300 in 1980 to only 16 by June 1986. The 16 operating mines employ a total of about 450 workers. This is a decline from 5,706 workers in 1979. Currently, all underground uranium mining in the United States takes place in the western United States.

Uranium mining involves the handling of large quantities of ore containing uranium and its decay products. The concentrations of the radionuclides in the ore may be up to one thousand times greater than their concentration in other rocks and soils. Underground uranium mines have generally accounted for about thirty to forty percent of the uranium oxide production in the United States.

In addition to uranium mines, MSHA's existing radiation standards apply to any underground metal or nonmetal mines which contain concentrations of radon daughters exceeding 0.1 WL. The proposal would apply at an action level of 0.2 WL. Generally, radiation levels in these mines are much lower than levels in uranium mines. Although thoron daughters have been found in nonuranium mines, there are currently no operating mines which contain significant levels. During fiscal year 1985, MSHA inspectors sampled for radon daughters at 254 non-uranium underground mines. Thirty-eight operating mines of the 254 nonuranium underground mines sampled had radon daughter readings in excess of 0.1 WL. Twenty-seven of these mines had samples which exceeded .2 WL. A

review of the historical data regarding radon daughter exposure levels indicates that the commodities most likely to contain significant levels of radon daughters include gold-silver, lead-zinc, antimony, iron, molybdenum and tungsten for metal mines; and clay-shale, fluorspar, talc and limestone for the nonmetal mines. In June 1986, total employment in underground mines producing these commodities was 9,870 and the total number of full time producing mines was 160.

The primary health risk from radon daughters is lung cancer caused by their inhalation. Gamma radiation also contributes to lung cancer, but affects the whole body, potentially causing cancers in other parts of the body or genetic damage.

The existing standards provide for an individual limit of 4 WLM per year for radon daughters and a limit of 5 rem per year for gamma radiation. MSHA estimates a lifetime risk of 1 to 6 lung cancer cases per 10,000 workers for each WLM of exposure to radon daughters. For gamma radiation, MSHA accepts ICRP's projected expectation of radiation induced health damage of 1.65 cases per 10,000 workers per rem (ICRP Publications 26 and 32). This health damage includes both cancer risk and risk of serious hereditary damage in two generations of offspring.

The average exposure to radon daughters for currently operating underground mines was 1.22 WLM in 1985. The lifetime risk is associated with annual increments in exposure (WLM). At the current low levels of employment, the lifetime benefits in terms of reduced cases of fatal lung cancer for uranium and nonuranium mines is estimated to range between .06 and .37 cases. If the industry were to recover to previous levels of employment, the benefits would be substantially greater.

Under the proposed rule, the separate annual exposure limits for radon daughters and gamma radiation would not be changed. However, the sum rule would in effect keep the annual exposures for both below their individual limits when more than one type of radiation is present. The percentage of miners potentially over-exposed is an important factor in addressing costs and benefits. According to exposure data examined, approximately 10 percent of the individual workers would have been above the limit of the proposed sum rule in 1985. Preliminary data for 1986 indicate that mining of higher-grade ore could raise this percentage substantially; however, this data will not be finalized until early 1987.

Initially, if the 1985 percentage prevails, MSHA assumes operators would meet the proposed sum rule by reducing the concentration of radon daughters through increased ventilation. This procedure would lower the risk to the individuals having higher cumulative exposures as well as others in the mine. In addition, the proposed reduced action level for monitoring cumulative exposures for individuals is expected to have the effect of reduction of radon daughter concentrations in non-uranium mines through use of increased ventilation.

The estimated cost of the current standard, as well as the proposed rule, is dependent upon the number of mines and employees in the uranium industry and in the mining of other commodities. The annual cost of the current regulation is estimated to be \$9.2 million. The annual incremental cost of the proposed regulation is estimated to be \$1.7 million. The cost increase is mostly the result of estimated increases in ventilation requirements in uranium and non-uranium mines. The incremental cost does reflect a small savings due to changes in the frequency of monitoring at levels below 0.2 WL. A number of areas of increased flexibility and, therefore, potential savings have been identified in the cost analysis but are not estimated due to data constraints. The total estimated cost of the proposed rule would be \$10.9 million. MSHA believes that due to these factors this constitutes a worst case estimate. The estimated increase does not represent a significant economic impact on a substantial number of small entities.

MSHA particularly requests information from the mining community on the economic impact of lowering radiation exposure limits, establishing a limit for the term of pregnancy, and implementing the sum rule, as well as the potential impact of a lifetime cumulative exposure.

V. Paperwork Reduction Act

The paperwork requirements contained in the proposed rule have been submitted to the Office of Management and Budget (OMB) for review under section 3504(h) of the Paperwork Reduction Act of 1980. Comments on the proposed paperwork provisions should be sent directly to the Office of Information and Regulatory Affairs, Office of Management and Budget, Attention: Desk Officer for MSHA.

List of Subjects in 30 CFR Part 57

Mine safety and health, Radiation protection, Recordkeeping and recording requirements.

Accordingly, it is proposed to amend Chapter I of Title 30, Code of Federal Regulations as set forth below.

Dated: December 16, 1986.

David A. Zegeer,

Assistant Secretary for Mine Safety and Health.

PART 57—[AMENDED]

It is proposed to amend Subpart D, Part 57, Subchapter N, Chapter I, Title 30 of the Code of Federal Regulations as follows:

1. The table of contents of Subpart D is revised, the text of which appears below.
2. The definition of "Working level" in § 57.2 is redesignated under § 57.5000 and revised as "Working level" and "Working level month."
3. Section 57.5700 is added, the text of which appears below.
4. Section 57.5037 is redesignated and revised as § 57.5702, the text of which appears below.
5. Sections 57.5038, 57.5039, 57.5044, 57.5046 are redesignated and revised as § 57.5701, the text of which appears below.
6. Section 57.5040 is redesignated and revised as § 57.5702 and 57.5704, the text of which appears below.
7. Section 57.5041 is redesignated and revised as § 57.5706, the text of which appears below.
8. Section 57.5042 is removed.
9. Section 57.5046 is redesignated and revised as § 57.5703, the text of which appears below.
10. Section 57.5705 is added.

PART 57—SAFETY AND HEALTH STANDARDS—UNDERGROUND METAL AND NONMETAL MINES

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Subpart D—Health Standards.

Sec.
57.5000 Definitions.

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Radiation

- 57.5700 Scope.
 - 57.5701 Control of exposure to radiation.
 - 57.5702 Monitoring for airborne radiation.
 - 57.5703 Measurement of gamma radiation.
 - 57.5704 Records.
 - 57.5705 Calculation of exposure to individuals.
 - 57.5706 Smoking prohibition.
- Authority: 30 U.S.C. 811.
- * * * * *

§ 57.5000 Definitions.

Working level (WL). The standard measure of concentration for any combination of short-lived radon daughters (Po218, Pb214, Bi214, and Po214) or thoron daughters (Po216, Pb212, Bi212, and Po212) in 1 liter of air that will ultimately result in the emission of 1.3×10^5 MeV (million electron volts) of alpha energy.

Working level month (WLM). A unit of cumulative exposure equivalent to an exposure to 1.0 working level for 173 hours.

* * * * *

Radiation

§ 57.5700 Scope.

Sections 57.5701 through 57.5706 pertain to occupational exposure to ionizing radiation underground.

§ 57.5701 Control of exposure to radiation.

(a) **Ceiling limits.** (1) No person shall be exposed to air containing concentrations of radon daughters exceeding 1.0 WL or thoron daughters exceeding 3.0 WL unless wearing approved respiratory protection. Areas in which radon daughter concentrations are above 1.0 WL or thoron daughter levels are above 3.0 WL shall be barricaded or posted as areas where approved respirators are required.

(2) If radon daughter concentrations in an area exceed 10 WL, supplied-air respiratory protection shall be used.

(b) **Combined limit.** Combined radiation exposure shall not exceed 1.0 for any person during any calendar year as determined by the following formula:

$$\text{Combined Radiation Exposure} = \frac{R}{4 \text{ WLM}} + \frac{T}{14 \text{ WLM}} + \frac{G}{5 \text{ rem}}$$

where—

R = the recorded calendar-year radon-daughter exposure in WLM.

T = the recorded calendar-year thoron-daughter exposure in WLM.

G = the recorded calendar-year whole-body gamma dose in rems.

(c) **Declared pregnancy.** The occupational whole-body gamma dose of a declared pregnant woman shall not exceed 0.50 rem during the entire pregnancy. If the occupational whole-body gamma dose of the pregnant woman has exceeded 0.50 rem between

the estimated date of conception and the declaration of pregnancy to the mine operator, the woman shall not receive an additional occupational whole-body gamma dose exceeding 0.05 rem during the remainder of the pregnancy. A declared pregnant woman means a woman who has voluntarily informed her employer in writing of her pregnancy and estimated date of conception.

(d) *Means of control.* The mine operator shall use feasible engineering or administrative controls to maintain exposure of all persons at or below the exposure limits in this section. When use of these controls alone does not reduce exposure to these limits, the controls shall be used to reduce exposure in so far as feasible and be supplemented with respiratory protection.

§ 57.5702 Monitoring for airborne radiation.

(a) *Action level.* When a mine is identified as having radon daughter concentrations above 0.20 WL or thoron daughter concentrations above 0.60 WL, the provisions of this section shall apply unless the concentrations can be promptly reduced and maintained below these levels or the areas are barricaded or posted against entry.

(b) *Frequency.*—(1) *Weekly.* Areas where radon daughter concentrations exceed 0.20 WL or thoron daughter concentrations exceed 0.60 WL shall be sampled on a random basis at least once each calendar week that any person enters the area.

(2) *Monthly.* Areas with concentrations of radon daughters at or below 0.20 WL or thoron daughters at or below 0.60 WL that are entered by persons whose exposures are monitored because of their exposure in other areas in the mine shall be sampled on a random basis at least once each calendar month for inclusion in exposure records.

(3) *Changes in frequency.* (i) *Weekly sampling frequency for airborne radiation* may be changed to monthly and remain monthly in an area so long as the lowest and highest results of the last 4 samples (weekly or monthly) differ no more than 0.12 WL. If the difference is more than 0.12 WL, the sampling frequency shall revert to weekly.

(ii) *Monthly sampling frequency* may be changed to quarterly and remain quarterly in an area so long as the lowest and highest results of the last 4 samples (monthly or quarterly) differ no more than 0.09 WL. If the difference is more than 0.09 WL but less than 0.12 WL, the sampling frequency shall revert to monthly. If the difference is 0.12 WL

or more, the sampling shall revert to weekly.

(c) *Procedures.* (1) Sampling shall be conducted by a person trained or experienced in the appropriate procedures.

(2) Radon daughter concentrations shall be sampled by a method that does not underestimate the radon daughter concentration by more than 30 percent at 0.33 WL with 84 percent confidence.

(3) Thoron daughter concentrations shall be sampled by a method that does not underestimate the thoron daughter concentration by more than 30 percent at 1.0 WL with 84 percent confidence.

(d) *Observation of monitoring.* The mine operator shall provide affected persons or their representatives with an opportunity to observe exposure monitoring pertinent to the affected persons' records.

§ 57.5703 Gamma dosimetry.

The mine operator shall provide individual gamma radiation dosimeters—

(a) For all persons whose whole-body dose rate from gamma radiation exceeds an average of 0.75 millirem/hour during any shift; and

(b) For the term of the pregnancy if the whole-body dose rate from gamma radiation of a declared pregnant woman exceeds an average of 0.33 millirem/hour during any shift.

§ 57.5704 Records.

(a) *Airborne radiation.* (1) The mine operator shall calculate and record the calendar-year individual radon daughter exposures for each person entering any area where radon daughter concentrations exceed 0.20 WL when gamma dosimetry is required for that person or 0.30 WL when gamma dosimetry is not required. Records shall include concentrations of radon daughters in each work area and the person's time to the nearest half-hour in each work area, including work areas where concentrations are at or below these levels;

(2) The mine operator shall calculate and record the calendar-year individual thoron daughter exposures for all person entering any area where thoron daughter concentrations exceed 0.60 WL. Records shall include concentrations of thoron daughters in each work area and the person's time to the nearest half-hour in each work area, including work areas where concentrations are at or below 0.60 WL; and

(3) The record shall indicate those exposures that reflect use of respirators.

(4) Recordkeeping may be discontinued for an individual if—

(i) The person is no longer exposed to radon daughter concentrations above 0.20 WL or thoron daughter concentrations above 0.60 WL; and

(ii) The individual's calendar year radon-daughter exposure does not exceed $\frac{1}{10}$ of a WLM multiplied by the number of months of recorded exposure or thoron-daughter exposure does not exceed $\frac{1}{10}$ of a WLM multiplied by the number of months of recorded exposure.

(b) *Gamma radiation.* (1) The mine operator shall maintain a record of the individual gamma dose for the current calendar year for each person for whom gamma dosimetry is required.

(2) Gamma dosimetry may be discontinued for a person whose dose rate is less than an average of 0.75 millirem/hour during any shift and the person's calendar year dose does not exceed 125 millirems multiplied by the number of months of recorded exposure in that calendar year.

(c) *Updating.* Calendar-year records for each individual shall be updated within 60 days of the end of each calendar quarter.

(d) *Retention of records.* All sampling data, individual occupancy records, and combined exposure records shall be retained at the mine or the nearest mine office for one calendar year past the calendar year to which they pertain.

(e) *Access to records.* Persons shall have access to their exposure records and the data used to compute those records. Miners' representatives shall have access to records of required exposure monitoring for persons whom they represent. Former employees shall have access to their exposure records. The mine operator shall provide a record of a person's exposures and doses to the person upon termination of employment.

(f) *Notification of overexposure.* Persons whose exposure exceeds any of the limits of § 57.5701 shall be promptly notified of their overexposure and the corrective action being taken.

§ 57.5705 Calculation of exposure to individuals.

Exposure of persons to radon daughter or thoron daughter concentrations shall be calculated in the following manner:

(a) For each area, the average radon daughter or thoron daughter concentration in WL (to the nearest hundredth) shall be determined by averaging two consecutive sampling results for the area. This average concentration shall be used for persons in that area during any portion of the time between samples. If the time of a sudden change in concentration

between two consecutive samples can be determined, the result of the first sample may be used as the average concentration for the time prior to the change and the result of the second sample may be used as the average concentration for the time subsequent to the change. A sample taken by a Federal or State mine inspector and reported to the operator within 3 days shall be included in calculating the average concentration; however, if the mine operator has sampled simultaneously with the inspector, the operator's own sampling results may be used.

(b) For each person—

(1) The exposure time in each area shall be rounded to the nearest half-hour.

(2) The exposure time (hours) in each area shall be multiplied by the applicable average concentration (WL) to calculate the person's exposure in working level hours (WLH) to the nearest hundredth.

(3) The working level hours (WLH) of exposure during the calendar quarter shall be added together and the sum divided by 173 to calculate the person's quarterly exposure in working level months (WLM). The quarterly exposures in WLM (to the nearest hundredth) for the calendar year shall be added together to calculate the person's calendar year exposure. Shorter periods of time than quarterly may be used to convert WLH to WLM as long as the quarterly WLM exposure is accurate to the nearest hundredth.

(c) When respiratory protective equipment is used for short-term entry into areas of radon daughter or thoron daughter concentrations for the purpose of inspection, maintenance, or installation of controls or to supplement feasible controls as required by § 57.5701(d), the following adjustments may be made in calculating exposure:

(1) For approved respirators that remove airborne radionuclides, the

respirator wearer's exposure may be considered to be 10.0 percent of the last measured radon daughter and thoron daughter concentration in the area prior to respirator use for the time the respirator is worn.

(2) For approved supplied-air respirators, the respirator wearer's exposure may be calculated on the basis of the radon daughter and thoron daughter concentrations present in the supplied air for the time the respirator is worn.

§ 57.5706 Smoking prohibition.

Smoking shall be prohibited underground in any mine where airborne radiation exposure records are required.

[FR Doc. 86-28470 Filed 12-18-86; 8:45 am]

BILLING CODE 4510-43-M

26 CFR Part 1.602

Friday
December 19, 1986

Part VI

Department of the Treasury

Internal Revenue Service

26 CFR Parts 1 and 602

Income Taxes: Unisex Annuity Tables;
Final Regulations

DEPARTMENT OF THE TREASURY**Internal Revenue Service****Income Taxes; Unisex Annuity Tables****26 Parts 1 and 602****[T.D. 8115]****AGENCY:** Internal Revenue Service, Treasury.**ACTION:** Final regulations.

SUMMARY: This document contains final regulations relating to the annuity tables used to compute the portion of the amount received as an annuity that is includible in gross income. Questions have arisen concerning the gender distinction in the existing tables and the outdated mortality experience on which those tables are based. These regulations affect taxpayers receiving amounts as annuities under annuity, endowment, and life insurance contracts for which they have paid premiums or other consideration and provide them with the guidance needed to determine the amount includible in gross income with respect to such contracts. This document also contains final regulations relating to the computations necessary to determine the amount excludable from an employee's gross income by allocation of contributions when the actual employer contributions are not known. In addition, this document removes certain regulations relating to defined benefit plans that provided benefits for employees who were either self-employed or a shareholder-employee.

EFFECTIVE DATE: The final regulations relating to amounts received as an annuity under section 72 (§§ 1.72-4, 1.72-5, 1.72-6, 1.72-7, 1.72-9, and 1.72-11) are effective on July 1, 1986, and apply to amounts received as an annuity after June 30, 1986. The final regulations under § 1.72-6 provide transitional rules applicable to amounts received under certain contracts in which an amount is invested before July 1, 1986. The final regulations under section 403(b) (§ 1.403(b)-1(d)(4)) are effective for taxable years beginning after July 1, 1986. The removal of §§ 1.401(a)-18 and 1.401(j)-1 through -6 are effective for plan years beginning after December 31, 1983. The amendment to § 602.101 is effective July 1, 1986.

FOR FURTHER INFORMATION CONTACT: For further information concerning the amendments relating to the annuity tables, contact Annette J. Guarisco of the Legislation and Regulations Division, Office of Chief Counsel, Internal Revenue Service, 1111 Constitution Avenue NW., Washington,

DC 20224 (Attention: CC:LR:T). Telephone 202-566-3238 (not a toll-free call).

For further information concerning IRC sections 401(a)(18), 401(j), or 403(b), contact Monice Rosenbaum of the Employee Plans and Exempt Organizations Division, Office of Chief Counsel, Internal Revenue Service, 1111 Constitution Avenue NW., Washington, DC 20224 (Attention: CC:LR:T:EE-114-82). Telephone 202-566-3422 (Not a toll-free call).

SUPPLEMENTARY INFORMATION:**Background**

On March 24, 1986, the Federal Register published proposed amendments (51 FR 9978) to the Income Tax Regulations (26 CFR Part 1) and the Table of OMB Control Numbers (26 CFR Part 602). The amendments were proposed to update and gender-neutralize the annuity tables used to determine the exclusion ratio applicable to amounts received as annuities under annuity, endowment, or life insurance contracts. The proposed amendments also contained transitional rules applicable to certain contracts in which amounts were invested prior to July 1, 1986.

The preamble to the proposed regulations discussed the data that served as the basis of the proposed annuity tables and requested comments on the appropriateness of the assumptions used to develop the proposed annuity tables.

Many comments on the proposed regulations were received addressing this and other issues. In addition, the proposed regulations were the subject of a public hearing held at the National Office of the Internal Revenue Service on May 21, 1986. After consideration of the comments received and the statements made at the public hearing, the proposed regulations are adopted as revised by this Treasury decision.

Revised Annuity Tables**In General**

Section 72 permits a taxpayer to exclude from gross income that part of any amount received as an annuity which bears the same ratio to such amount as the investment in the contract as of the annuity starting date bears to the expected return under the contract as of such date. If the expected return depends in whole or in part on the life expectancy of one or more individuals, the statute requires that the expected return be computed by reference to actuarial tables prescribed by the Secretary of the Treasury. Soon after section 72 was enacted in 1954, the

Secretary published regulations containing tables based on 1937 mortality and distinguished by gender (Tables I through IV of § 1.72-9). The effect of the gender distinction is that women are not entitled to exclude from gross income as high a proportion of the amount received as an annuity as men of the same age. The final regulations provide annuity tables that are not distinguished by gender and are based on more recent mortality experience.

Mortality data

The final regulations adopt the mortality assumptions used to develop the proposed annuity tables. Thus, the revised tables are based, as are Tables I through IV of § 1.72-9, on individual annuitant mortality. Commentators stated that the mortality used to develop the revised tables was appropriate and that they were unaware of any other data that would be more relevant for determining the life expectancies of taxpayers receiving amounts taxable under section 72.

Gender mix

The final regulations also retain the gender mix used to develop the proposed annuity tables. Thus, the revised annuity tables assume that the population mix of males and females expected to use the section 72 annuity tables is the same as that of the individual annuitants whose mortality is reflected in the Society of Actuaries study that serves as the basis of the revised annuity tables.

Some commentators stated that there is not necessarily a relationship between the gender mix of individuals expected to use the section 72 annuity tables and the gender mix of individuals whose mortality is reflected in the Society of Actuaries study. They suggested applying a 50-50 gender mix.

These same commentators admitted, however, that it is appropriate to use the mortality of individual annuitants to construct the annuity tables. In addition, the commentators did not provide any data indicating that a 50-50 gender mix more appropriately reflects the gender mix of taxpayers expected to apply the section 72 annuity tables than the gender mix of individual annuitants.

Table VI

Table VI of § 1.72-9 provides expected return multiples for ordinary joint life and last survivor annuitants. Commentators stated that the transition of multiples contained in Table VI of the proposed regulations was not as smooth as the transition of multiples contained in the other proposed annuity tables.

They suggested applying a different methodology to calculate the expected return multiples in Table IV to provide a smoother transition. The final regulations adopt this suggestion.

Transitional Rules

The proposed amendments contained two transitional rules applicable to certain contracts in which amounts were invested before July 1, 1986. The first rule applies to certain contracts in which no amount was invested after June 30, 1986, and provides that taxpayers must apply Tables I through IV of § 1.72-9 to amounts received under such contracts. The second proposed transitional rule applies to certain contracts in which an amount was invested both before July 1, 1986, and after June 30, 1986, and provides that taxpayers may elect to apply Tables I through IV to the extent of their pre-July 1, 1986 investment in the contract.

Some commentators stated that these transitional rules are contrary to a national policy against discrimination by government agencies and requested that they be removed from the regulations. The Service and Treasury carefully considered these comments, but believe that transitional relief is appropriate because taxpayers have relied on Tables I through IV in determining the extent to which they should invest in annuity contracts. Moreover, the Service and Treasury do not believe taxpayers currently receiving payment as annuities should be required to recalculate their exclusion ratios as would be the case if no transitional relief were provided.

The final regulations amend the proposed transitional rules to permit taxpayers to apply the gender-neutral annuity tables to amounts received after June 30, 1986, under contracts in which no amount was invested after June 30, 1986. Thus, taxpayers who purchased contracts before June 30, 1986, may apply the gender-neutral annuity tables to amounts received as annuities after June 30, 1986, regardless of when they first began receiving amounts as annuities under such contracts.

Effective Date

The final regulations retain the proposed effective date of July 1, 1986. Many charitable organizations requested a postponement until January 1, 1987, stating that they needed more time to revise their publications used in presentations to prospective charitable donors. The Service and Treasury believe that this concern is outweighed by the substantive tax consequences of a postponement.

Refund Feature of Joint and Survivor Annuity Contract

The final regulations provide a formula for valuing the refund feature of a joint and survivor annuity contract purchased after the effective date of the revised annuity tables. Commentators suggested that the existing section 72 rules are not appropriate for determining the value of a refund feature of a post-effective date annuity contract.

Section 403 (b) Regulations

The final regulations adopt without change the provisions of the proposed regulations (including the tables) relating to section 403(b).

Required Minimum Distributions

Commentators questioned whether taxpayers may apply the gender-neutral annuity tables to determine the required minimum distributions under sections 401(a)(9), 408(a)(6), and 408(b)(3). In response, the Service and Treasury have determined that taxpayers must apply the gender-neutral tables to calculate the amount of such distributions.

Executive Order 12291, Regulatory Flexibility Act, and Paperwork Reduction Act

The Commissioner of Internal Revenue has determined that this final rule is not a major rule as defined in Executive Order 12291 and that a regulatory impact analysis therefore is not required.

Although a notice of proposed rulemaking that solicited public comment was issued, the Internal Revenue Service concluded when the notice was issued that the regulations are interpretative and that the notice and public procedure requirements of 5 U.S.C. 553 did not apply. Accordingly, the final regulations do not constitute regulations subject to the Regulatory Flexibility Act (5 U.S.C. Chapter 6).

The collection of information requirements contained in these regulations have been submitted to the Office of Management and Budget in accordance with the requirements of the Paperwork Reduction Act of 1980. These requirements have been approved by OMB.

Drafting Information

The principal author of the regulations under section 72 is Annette J. Guarisco of the Legislation and Regulations Division of the Office of Chief Counsel, Internal Revenue Service. The principal author of the section 401 and 403 regulations is Monice Rosenbaum of the Employee Plans and Exempt Organizations Division, Office of Chief

Counsel, Internal Revenue Service. However, personnel from other offices of the Internal Revenue Service and Treasury Department participated in developing the regulations on matters of both substance and style.

List of Subjects

26 CFR 1.61-2-1.281-4

Income taxes, Taxable, income, Deductions, Exemptions.

26 CFR 1.401-0-1.425-1

Income taxes, Employee benefit plan, Pensions, Stock options, Individual retirement accounts, Employee stock ownership plans.

26 CFR Part 602

Reporting and recordkeeping requirements.

Adoption of Amendments to the Regulations

For the reasons set out in the preamble, Subchapter A, Part 1 and Subchapter H, Part 602 of Title 26, Chapter 1 of the Code of Federal Regulations are amended as set forth below:

PART 1—INCOME TAX REGULATIONS

Paragraph 1. The authority for Part 1 is amended by adding the following citation:

Authority: 26 U.S.C. 7805. * * * Sections 1.72-4, 1.72-5, 1.72-6, 1.72-7, 1.72-8, and 1.72-11 also issued under 26 U.S.C. 72(c).

Par. 2. Section 1.72-4 is amended by revising paragraphs (a), (d), and (e) to read as follows:

§ 1.72-4 Exclusion ratio.

(a) *General rule.* (1) (i) To determine the proportionate part of the total amount received each year as an annuity which is excludable from the gross income of a recipient in the taxable year of receipt (other than amounts received under (a) certain employee annuities described in section 72(d) and § 1.72-13, or (b) certain annuities described in section 72(o) and § 1.122-1), an exclusion ratio is to be determined for each contract. In general, this ratio is determined by dividing the investment in the contract as found under § 1.72-6 by the expected return under such contract as found under § 1.72-5. Where a single consideration is given for a particular contract which provides for two or more annuity elements, an exclusion ratio shall be determined for the contract as a whole by dividing the investment in such contract by the aggregate of the expected returns under all the annuity

elements provided thereunder. However, where the provisions of paragraph (b)(3) of § 1.72-2 apply to payments received under such a contract, see paragraph (b)(3) of § 1.72-6. In the case of a contract to which § 1.72-6(d) (relating to contracts in which amounts were invested both before July 1, 1986, and after June 30, 1986) applies, the exclusion ratio for purposes of this paragraph (a) is determined in accordance with § 1.72-6(d) and, in particular, § 1.72-6(d)(5)(i).

(ii) The exclusion ratio for the particular contract is then applied to the total amount received as an annuity during the taxable year by each recipient. See, however, paragraph (e)(3) of § 1.72-5. Any excess of the total amount received as an annuity during the taxable year over the amount determined by the application of the exclusion ratio to such total amount shall be included in the gross income of the recipient for the taxable year of receipt.

(2) The principles of subparagraph (1) may be illustrated by the following example:

Example. Taxpayer A purchased an annuity contract providing for payments of \$100 per month for a consideration of \$12,650. Assuming that the expected return under this contract is \$16,000 the exclusion ratio to be used by A is $\$12,650 \div \$16,000$, or 79.1 percent (79.06 rounded to the nearest tenth). If 12 such monthly payments are received by A during his taxable year, the total amount he may exclude from his gross income in such year is \$949.20 ($\$1,200 \times 79.1$ percent). The balance of \$250.80 ($\$1,200$ less \$949.20) is the amount to be included in gross income. If A instead received only five such payments during the year, he should exclude \$395.50 (500×79.1 percent) of the total amounts received.

For examples of the computation of the exclusion ratio in cases where two annuity elements are acquired for a single consideration, see paragraph (b)(1) of § 1.72-6.

(3) The exclusion ratio shall be applied only to amounts received as an annuity within the meaning of that term under paragraph (b) (2) and (3) of § 1.72-2. Where the periodic payments increase in amount after the annuity starting date in a manner not provided by the terms of the contract at such date, the portion of such payments representing the increase is not an amount received as an annuity. For the treatment of amounts not received as an annuity, see section 72(e) and § 1.72-11. For special rules where paragraph (b) (3) of § 1.72-2 applies to amounts received, see paragraph (d)(3) of this section.

(4) After an exclusion ratio has been determined for a particular contract, it shall be applied to any amounts

received as an annuity thereunder unless or until one of the following occurs:

(i) The contract is assigned or transferred for a valuable consideration (see section 72(g) and paragraph (a) of § 1.72-10);

(ii) The contract matures or is surrendered, redeemed, or discharged in accordance with the provisions of paragraph (c) or (d) of § 1.72-11;

(iii) The contract is exchanged (or is considered to have been exchanged) in a manner described in paragraph (e) of § 1.72-11.

(d) *Exceptions to the general rule.* (1) Where the provisions of section 72 would otherwise require an exclusion ratio to be determined, but the investment in the contract (determined under § 1.72-6) is an amount of zero or less, no exclusion ratio shall be determined and all amounts received under such a contract shall be includible in the gross income of the recipient for the purposes of section 72.

(2) Where the investment in the contract is equal to or greater than the total expected return under such contract found under § 1.72-5, the exclusion ratio shall be considered to be 100 percent and all amounts received as an annuity under such contract shall be excludable from the recipient's gross income. See, for example, paragraph (f)(1) of § 1.72-5. In the case of a contract to which § 1.72-6(d) (relating to contracts in which amounts were invested both before July 1, 1986, and after June 30, 1986) applies, this paragraph (d)(2) is applied in the manner prescribed in § 1.72-6(d) and, in particular, § 1.72-6(d)(5)(ii).

(3)(i) If a contract provides for payments to be made to a taxpayer in the manner described in paragraph (b)(3) of § 1.72-2, the investment in the contract shall be considered to be equal to the expected return under such contract and the resulting exclusion ratio (100%) shall be applied to all amounts received as an annuity under such contract. For any taxable year, payments received under such a contract shall be considered to be amounts received as an annuity only to the extent that they do not exceed the portion of the investment in the contract which is properly allocable to that year and hence excludable from gross income as a return of premiums or other consideration paid for the contract. The portion of the investment in the contract which is properly allocable to any taxable year shall be determined by dividing the investment in the contract (adjusted for any refund feature in the

manner described in paragraph (d) of § 1.72-7) by the applicable multiple (whether for a term certain, life, or lives) which would otherwise be used in determining the expected return for such a contract under § 1.72-5. The multiple shall be adjusted in accordance with the provisions of the table in paragraph (a)(2) of § 1.72-5, if any adjustment is necessary, before making the above computation. If payments are to be made more frequently than annually and the number of payments to be made in the taxable year in which the annuity begins are less than the number of payments to be made each year thereafter, the amounts considered received as an annuity (as otherwise determined under this subdivision) shall not exceed, for such taxable year (including a short taxable year), an amount which bears the same ratio to the portion of the investment in the contract considered allocable to each taxable year as the number of payments to be made in the first year bears to the number of payments to be made in each succeeding year. Thus, if payments are to be made monthly, only seven payments will be made in the first taxable year, and the portion of the investment in the contract allocable to a full year of payments is \$600, the amounts considered received as an annuity in the first taxable year cannot exceed \$350 ($\$600 \times \frac{7}{12}$). See subdivision (iii) of this subparagraph for an example illustrating the determination of the portion of the investment in the contract allocable to one taxable year of the taxpayer.

(ii) If subdivision (i) of this subparagraph applies to amounts received by a taxpayer and the total amount of payments he receives in a taxable year is less than the total amount excludable for such year under subdivision (i) of this subparagraph, the taxpayer may elect, in a succeeding taxable year in which he receives another payment, to redetermine the amounts to be received as an annuity during the current and succeeding taxable years. This shall be computed in accordance with the provisions of subdivision (i) of this subparagraph except that:

(a) The difference between the portion of the investment in the contract allocable to a taxable year, as found in accordance with subdivision (i) of this subparagraph, and the total payments actually received in the taxable year prior to the election shall be divided by the applicable life expectancy of the annuitant (or annuitants), found in accordance with the appropriate table in § 1.72-9 (and adjusted in accordance

with paragraph (a)(2) of § 1.72-5, or by the remaining term of a term certain annuity, computed as of the first day of the first period for which an amount is received as an annuity in the taxable year of the election; and

(b) The amount determined under (a) of this subdivision shall be added to the portion of the investment in the contract allocable to each taxable year (as otherwise found). To the extent that the total periodic payments received under the contract in the taxable year of the election or any succeeding taxable year does not equal this total sum, such payments shall be excludable from the gross income of the recipient. To the extent such payments exceed the sum so found, they shall be fully includable in the recipient's gross income. See subdivision (iii) of this subparagraph for an example illustrating the redetermination of amounts to be received as an annuity and subdivision (iv) of this subparagraph for the method of making the election provided by this subdivision.

(iii) The application of the principles of paragraph (d)(3) (i) and (ii) of this section may be illustrated by the following example:

Example. Taxpayer A, a 64 year old male, files his return on a calendar year basis and has a life expectancy of 15.6 years on June 30, 1954, the annuity starting date of a contract to which § 1.72-2(b)(3) applies and which he purchased for \$20,000. The contract provides for variable annual payments for his life. He receives a payment of \$1,000 on June 30, 1955, but receives no other payment until June 30, 1957. He excludes the \$1,000 payment from his gross income for the year 1955 since this amount is less than \$1,324.50, the amount determined by dividing his investment in the contract (\$20,000) by his life expectancy adjusted for annual payments, 15.1 (15.6-0.5), as of the original annuity starting date. Taxpayer A may elect, in his return for the taxable year 1957, to redetermine amounts to be received as an annuity under his contract as of June 30, 1956. For the purpose of determining the extent to which amounts received in 1957 or thereafter shall be considered amounts received as an annuity (to which a 100 percent exclusion ratio shall apply) he shall add \$118.63 to the \$1,324.50 originally determined to be receivable as an annuity under the contract, making a total of \$1,443.13. This is determined by dividing the difference between what was excludable in 1955 and 1956, \$2,649 ($2 \times \$1,324.50$) and what he actually received in those years (\$1,000) by his life expectancy adjusted for annual payments, 13.9 (14.4-0.5), as of his age at his nearest birthday (66) on the first day of the first period for which he received an amount as an annuity in the taxable year of election (June 30, 1956). The result, \$1,443.13, is excludable in that year and each year thereafter as an amount received as an annuity to which the 100% exclusion ratio applies. It will be noted that in this example

the taxpayer received amounts less than the excludable amounts in two successive years and deferred making his election until the third year, and thus was able to accumulate the portion of the investment in the contract allocable to each taxable year to the extent he failed to receive such portion in both years. Assuming that he received \$1,500 in the taxable year of his election, he would include \$56.87 in his gross income and exclude \$1,443.13 therefrom for that year.

(iv) If the taxpayer chooses to make the election described in subdivision (ii) of this subparagraph, he shall file with his return a statement that he elects to make a redetermination of the amounts excludable from gross income under his annuity contract in accordance with the provisions of paragraph (d)(3) of § 1.72-4. This statement shall also contain the following information:

(a) The original annuity starting date and his age on that date,

(b) The date of the first day of the first period for which he received an amount in the current taxable year,

(c) The investment in the contract originally determined (as adjusted for any refund feature), and

(d) The aggregate of all amounts received under the contract between the date indicated in (a) of this subdivision and the day after the date indicated in (b) of this subdivision to the extent such amounts were excludable from gross income.

He shall include in gross income any amounts received during the taxable year for which the return is made in accordance with the redetermination made under this subparagraph.

(v) In the case of a contract to which § 1.72-6(d) (relating to contracts in which amounts were invested both before July 1, 1986, and after June 30, 1986) applies, this paragraph (d)(3) is applied in the manner prescribed in § 1.72-6(d) and, in particular, § 1.72-6(d)(5)(iii). This application may be illustrated by the following example:

Example. B, a male calendar year taxpayer, purchases a contract which provides for variable annual payments for life and to which § 1.72-2(b)(3) applies. The annuity starting date of the contract is June 30, 1990, when B is 64 years old. B receives a payment of \$1,000 on June 30, 1991, but receives no other payment until June 30, 1993. B's total investment in the contract is \$25,000. B's pre-July 1986 investment in the contract is \$12,000. If B makes the election described in § 1.72-6(d)(6), separate computations are required to determine the amounts received as an annuity and excludable from gross income with respect to the pre-July 1986 investment in the contract and the post-June 1986 investment in the contract. In the separate computations, B first determines the applicable portions of the total payment received which are allocable to the pre-July

1986 investment in the contract and the post-June 1986 investment in the contract. The portion of the payment received allocable to the pre-July 1986 investment in the contract is \$480 ($[\$12,000/\$25,000] \times \$1,000$). The portion of the payment received allocable to the post-June 1986 investment in the contract is \$520 ($[\$13,000/\$25,000] \times \$1,000$).

Second, B determines the pre-July 1986 investment in the contract and the post-June 1986 investment in the contract allocable to the taxable year by dividing the pre-July 1986 and post-June 1986 investments in the contract by the applicable life expectancy multiple. The life expectancy multiple applicable to pre-July 1986 investment in the contract is B's life expectancy as of the original annuity starting date adjusted for annual payments and is determined under Table I of § 1.72-9 [15.1 (15.6-0.5)]. The life expectancy multiple applicable to post-June 1986 investment in the contract is determined under Table V of § 1.72-9 [20.3 (20.8-0.5)]. Thus, the pre-July 1986 investment in the contract allocable to each taxable year is \$794.70 ($[\$480 \div 15.1]$), and the post-June 1986 investment in the contract so allocable is \$640.39 ($[\$520 \div 20.3]$). Because the applicable portions of the total payment received in 1991 under the contract (\$480 allocable to the pre-July 1986 investment in the contract and \$520 allocable to the post-June 1986 investment in the contract) are treated as amounts received as an annuity and are excludable from gross income to the extent they do not exceed the portion of the corresponding investment in the contract allocable to 1991 (\$794.70 pre-July 1986 investment in the contract and \$640.39 post-June 1986 investment in the contract), the entire amount of each applicable portion of the total payment is excludable from gross income. B may elect, in the return filed for taxable year 1993, to redetermine amounts to be received as an annuity under the contract as of June 30, 1992. The extent to which the amounts received in 1993 or thereafter shall be considered amounts received as an annuity is determined as follows:

Pre-July 1986 investment in the contract allocable to taxable years 1991 and 1992 ($\$794.70 \times 2$).....	\$1,589.40
Less: Portion of total payments allocable to pre-July 1986 investment in the contract actually received as an annuity in taxable years 1991 and 1992.....	480.00
	1,109.40
Divided by: Life expectancy multiple applicable to pre-July 1986 investment in the contract for B, age 66 (14.4-0.5).....	13.9
	79.81
Plus: Amount originally determined with respect to pre-July 1986 investment in the contract.....	794.70
Pre-July 1986 amount	874.51

Post-June 1986 investment in the contract allocable to taxable years 1991 and 1992 (\$640.39 × 2).....	\$1,280.78
Less: Portion of total payments allocable to post-June 1986 investment in the contract actually received as an annuity in taxable years 1991 and 1992.....	520.00
	760.78
Divided by: Life expectancy multiple applicable to post-June 1986 investment in the contract for B, age 66 (19.2 - 0.5).....	18.7
	40.68
Plus: Amount originally determined with respect to post-June 1986 investment in the contract.....	640.39
Post-June 1986 amount.....	681.07

(vi) The method of making an election to perform the separate computations illustrated in paragraph (d)(3)(v) of this section is described in § 1.72-6(d)(6).

(e) *Exclusion ratio in the case of two or more annuity elements acquired for a single consideration.* (1)(i) Where two or more annuity elements are provided under a contract described in paragraph (a)(2) of § 1.72-2, an exclusion ratio shall be determined for the contract as a whole and applied to all amounts received as an annuity under any of the annuity elements. To obtain this ratio, the investment in the contract determined in accordance with § 1.72-6 shall be divided by the aggregate of the expected returns found with respect to each of the annuity elements in accordance with § 1.72-5. For this purpose, it is immaterial that payments under one or more of the annuity elements involved have not commenced at the time when an amount is first received as an annuity under one or more of the other annuity elements.

(ii) The exclusion ratio found under subdivision (i) of this subparagraph does not apply to:

(a) An annuity element payable to a surviving annuitant under a joint and survivor annuity contract to which section 72(i) and paragraphs (b)(3) and (e)(3) of § 1.72-5 apply, or to

(b) A contract under which one or more of the constituent annuity elements provides for payments described in paragraph (b)(3) of § 1.72-2.

For rules with respect to a contract providing for annuity elements described in (b) of this subdivision, see subparagraph (2) of this paragraph.

(2) If one or more of the annuity elements under a contract described in paragraph (a)(2) of § 1.72-2 provides for

payments to which paragraph (b)(3) of § 1.72-2 applies:

(i) With respect to the annuity elements to which paragraph (b)(3) of § 1.72-2 does not apply, an exclusion ratio shall be determined by dividing the portion of the investment in the entire contract which is properly allocable to all such elements (in the manner provided in paragraph (b)(3)(ii) of § 1.72-6) by the aggregate of the expected returns thereunder and such ratio shall be applied in the manner described in subdivision (i) of subparagraph (1); and

(ii) With respect to the annuity elements to which paragraph (b)(3) of § 1.72-2 does apply, the investment in the entire contract shall be reduced by the portion thereof found in subdivision (i) of this subparagraph and the resulting amount shall be used to determine the extent to which the aggregate of the payments received during the taxable year under all such elements is excludable from gross income. The amount so excludable shall be allocated to each recipient under such elements in the same ratio that the total of payments he receives each year bears to the total of the payments received by all such recipients during the year. The exclusion ratio with respect to the amounts so allocated shall be 100 percent. See paragraph (f)(2) of § 1.72-5 and paragraph (b)(3) of § 1.72-6.

(iii) In the case of a contract to which § 1.72-6(d) (relating to contracts in which amounts were invested both before July 1, 1986, and after June 30, 1986) applies, this paragraph (e) is applied in the manner prescribed in § 1.72-6(d) and, in particular, § 1.72-6(d)(5)(iv).

Par. 3. Section 1.72-5 is amended by revising paragraphs (a), (b), and (e), and adding a new paragraph (g) to read as follows:

If the number of whole months from the annuity starting date to the first payment date is—	0-1	2	3	4	5	6	7	8	9	10	11	12
And the payments under the contract are to be made:												
Annually.....	+0.5	+0.4	+0.3	+0.2	+0.1	0	0	-0.1	-0.2	-0.3	-0.4	-0.5
Semiannually.....	+2	+1	0	0	-1	-2						
Quarterly.....	+1	0	-1									

Thus, for a male, age 66, the multiple found in Table I, adjusted for quarterly payments the first of which is to be made one full month after the annuity starting date, is 14.5 (14.4 + 0.1); for semiannual payments the first of which is to be made six full months from the

§ 1.72-5 Expected return.

(a) *Expected return for but one life.* (1) If a contract to which section 72 applies provides that one annuitant is to receive a fixed monthly income for life, the expected return is determined by multiplying the total of the annuity payments to be received annually by the multiple shown in Table I or V (whichever is applicable) of § 1.72-9 under the age (as of the annuity starting date) and, if applicable, sex of the measuring life (usually the annuitant's). Thus, where a male purchases a contract before July 1, 1986, providing for an immediate annuity of \$100 per month for his life and, as of the annuity starting date (in this case the date of purchase), the annuitant's age at his nearest birthday is 66, the expected return is computed as follows:

Monthly payment of \$100 × 12 months equals annual payment of.....	\$1,200
Multiple shown in Table I, male, age 66.....	14.4
Expected return (1,200 × 14.4).....	17,280

If, however, the taxpayer had purchased the contract after June 30, 1986, the expected return would be \$23,040, determined by multiplying 19.2 (multiple shown in Table V, age 66) by \$1,200.

(2) (i) If payments are to be made quarterly, semiannually, or annually, an adjustment of the applicable multiple shown in Table I or V (whichever is applicable) may be required. A further adjustment may be required where the interval between the annuity starting date and the date of the first payment is less than the interval between future payments. Neither adjustment shall be made, however, if the payments are to be made more frequently than quarterly. The amount of the adjustment, if any, is to be found in accordance with the following table:

annuity starting date, the adjusted multiple is 14.2 (14.4 - 0.2); for annual payments the first of which is to be made one full month from the annuity starting date, the adjusted multiple is 14.9 (14.4 + 0.5). If the annuitant in the example shown in subparagraph (1) of

this paragraph were to receive an annual payment of \$1,200 commencing 12 full months after his annuity starting date, the amount of the expected return would be \$16,680 ($\$1,200 \times 13.9$ [14.4 - 0.5]). Similarly, for an annuitant, age 50, the multiple found in Table V, adjusted for quarterly payments the first of which is to be made one full month after the annuity starting date, is 33.2 (33.1 + 0.1); for semiannual payments the first of which is to be made six full months from the annuity starting date, the adjusted multiple is 32.9 (33.1 - 0.2); for annual payments the first of which is to be made one full month from the annuity starting date, the adjusted multiple is 33.6 (33.1 + 0.5).

(ii) Notwithstanding the table in subdivision (i) of this subparagraph, adjustments of multiples for early or other than monthly payments determined prior to February 19, 1956, under the table prescribed in paragraph 1(b)(4) of T.D. 6118 (19 FR 9897, C.B. 1955-1, 699), approved December 30, 1954, need not be redetermined.

(3) If the contract provides for fixed payments to be made to an annuitant until death or until the expiration of a specified limited period, whichever occurs earlier, the expected return of such temporary life annuity is determined by multiplying the total of the annuity payments to be received annually by the multiple shown in Table IV or VIII (whichever is applicable) of § 1.72-9 for the age (as of the annuity starting date) and, if applicable, sex of the annuitant and the nearest whole number of years in the specified period. For example, if a male annuitant, age 60 (at his nearest birthday), is to receive \$60 per month for five years or until he dies, whichever is earlier, and there is no post-June 1986, investment in the contract, the expected return under such a contract is \$3,456, computed as follows:

Monthly payments of $\$60 \times 12$ months equals annual payment of.....	\$720
Multiple shown in Table IV for male, age 60, for term of 5 years....	4.8
Expected return for 5 year temporary life annuity of \$720 per year ($\$720 \times 4.8$).....	\$3,456

If the annuitant purchased the same contract after June 30, 1986, the expected return under the contract would be \$3,528, computed as follows:

Monthly payments of $\$60 \times 12$ months equals annual payment of.....	\$720.00
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Multiple shown in Table VIII for annuitant, age 60, for term of 5 years.....	4.9
Expected return for 5-year temporary life annuity of \$720 per year ($\$720 \times 4.9$).....	\$3,528.00

The adjustment provided by subparagraph (2) of this paragraph shall not be made with respect to the multiple found in Table IV or VIII (whichever is applicable).

(4) If the contract provides for payments to be made to an annuitant for the annuitant's lifetime, but the amount of the annual payments is to be decreased after the expiration of a specified limited period, the expected return is computed by considering the contract as a combination of a whole life annuity for the smaller amount plus a temporary life annuity for an amount equal to the difference between the larger and the smaller amount. For example, if a male annuitant, age 60, is to receive \$150 per month for five years or until his earlier death, and is to receive \$90 per month for the remainder of his lifetime after such five years, the expected return is computed as if the annuitant's contract consisted of a whole life annuity for \$90 per month plus a five year temporary life annuity of \$60 per month. In such circumstances, the expected return if there is no post-June 1986 investment in the contract is computed as follows:

Monthly payments of $\$90 \times 12$ months equals annual payment of.....	\$1,080
Multiple shown in Table I for male, age 60.....	18.2
Expected return for whole life annuity of \$1,080 per year.....	\$19,656
Expected return for 5-year temporary life annuity of \$720 per year (as found in subparagraph (3) of this paragraph (a)).....	\$3,456
Total expected return.....	\$23,112

If the annuitant purchased the same contract after June 30, 1986, the expected return would be \$29,664, computed as follows:

Monthly payments of $\$90 \times 12$ months equals annual payment of.....	\$1,080
Multiple shown in Table V for annuitant, age 60.....	24.2
Expected return for whole life annuity of \$1,080 per year.....	\$26,136

Plus: Expected return for 5-year temporary life annuity of \$720 per year (as found in subparagraph (3) of this paragraph (a)).....	\$3,528
Total expected return.....	\$29,664

If payments are to be made quarterly, semiannually, or annually, an appropriate adjustment of the multiple found in Table I or V (whichever is applicable) for the whole life annuity should be made in accordance with subparagraph (2) of this paragraph.

(5) If the contract described in subparagraph (4) of this paragraph provided that the amount of the annual payments to the annuitant were to be increased (instead of decreased) after the expiration of a specified limited period, the expected return would be computed as if the annuitant's contract consisted of a whole life annuity for the larger amount minus a temporary life annuity for an amount equal to the difference between the larger and smaller amount. Thus, if the annuitant described in subparagraph (4) of this paragraph were to receive \$90 per month for five years or until his earlier death, and to receive \$150 per month for the remainder of his lifetime after such five years, the expected return would be computed by subtracting the expected return under a five year temporary life annuity of \$60 per month from the expected return under a whole life annuity of \$150 per month. In such circumstances, the expected return if there is no post-June 1986 investment in the contract is computed as follows:

Monthly payments of $\$150 \times 12$ months equals annual payment of.....	\$1,800
Multiple shown in Table I (male, age 60).....	18.2
Expected return for annuity for whole life of \$1,800 per year.....	\$32,760
Less expected return for 5-year temporary life annuity of \$720 per year (as found in subparagraph (3)).....	\$3,456
Net expected return.....	\$29,304

If the annuitant purchased the same contract after June 30, 1986, the expected return would be \$40,032, computed as follows:

Monthly payments of $\$150 \times 12$ months equals annual payments of.....	\$1,800
Multiple shown in Table V (age 60).....	24.2
Expected return for annuity for whole life of \$1,800 per year.....	\$43,560

Less expected return for 5-year temporary life annuity of \$720 per year (as found in subparagraph (3) of this paragraph (a)).....	\$3,528
Net expected return.....	\$40,032

If payments are to be made quarterly, semiannually, or annually, an appropriate adjustment of the multiple found in Table I or V (whichever is applicable) for the whole life annuity should be made in accordance with subparagraph (2) of this paragraph.

(b) *Expected return under joint and survivor and joint annuities.* (1) In the case of a joint and survivor annuity contract involving two annuitants which provides the first annuitant with a fixed monthly income for life and, after the death of the first annuitant, provides an identical monthly income for life to a second annuitant, the expected return shall be determined by multiplying the total amount of the payments to be received annually by the multiple obtained from Table II or VI (whichever is applicable) of § 1.72-9 under the ages (as of the annuity starting date) and, if applicable, sexes of the living annuitants. For example, a husband purchases a joint and survivor annuity contract providing for payments of \$100 per month for life and, after his death, for the same amount to his wife for the remainder of her life. As of the annuity starting date his age at his nearest birthday is 70 and that of his wife at her nearest birthday is 67. If there is no post-June 1986 investment in the contract, the expected return is computed as follows:

Monthly payments of \$100×12 months equals annual payment of.....	\$1,200
Multiple shown in Table II (male, age 70, female, age 67).....	19.7
Expected return (\$1,200×19.7).....	\$23,640

If the annuitants purchased the same contract after June 30, 1986, the expected return would be \$26,400, computed as follows:

Monthly payments of \$100×12 months equals annual payment of.....	\$1,200
Multiple shown in Table VI (ages 70, 67).....	22.0
Expected return (\$1,200×22.0).....	\$26,400

If payments are to be made quarterly, semiannually, or annually, an appropriate adjustment of the multiple found in Table II or VI (whichever is applicable) should be made in

accordance with paragraph (a)(2) of this section.

(2) If a contract of the type described in subparagraph (1) of this paragraph provides that a different (rather than an identical) monthly income is payable to the second annuitant, the expected return is computed in the following manner. The applicable multiple in Table II or VI (whichever is applicable) is first found as in the example in subparagraph (1) of this paragraph. The multiple applicable to the first annuitant is then found in Table I or V (whichever is applicable) as though the contract were for a single life annuity. The multiple from Table I or V is then subtracted from the multiple obtained from Table II or VI and the resulting multiple is applied to the total payments to be received annually under the contract by the second annuitant. The result is the expected return with respect to the second annuitant. The portion of the expected return with respect to payments to be made during the first annuitant's life is then computed by applying the multiple found in Table I or V to the total annual payments to be received by such annuitant under the contract. The expected returns with respect to each of the annuitants separately are then aggregated to obtain the expected return under the entire contract.

Example (1). A husband purchases a joint and survivor annuity providing for payments of \$100 per month for his life and, after his death, payments to his wife of \$50 per month for her life. As of the annuity starting date his age at his nearest birthday is 70 and that of his wife at her nearest birthday is 67. There is no post-June 1986 investment in the

Multiple from Table II (male, age 70, female, age 67).....	19.7
Multiple from Table I (male, age 70).....	12.1
Difference (multiple applicable to second annuitant).....	7.6
Portion of expected return, second annuitant (\$600×7.6).....	\$4,560
Portion of expected return, first annuitant (\$1,200×12.1).....	\$14,520
Expected return under the contract.....	\$19,080

The expected return thus found, \$19,080, is to be used in computing the amount to be excluded from gross income. Thus, if the investment in the contract in this example is \$14,310, the exclusion ratio is $\$14,310 \div \$19,080$, or 75 percent. The amount excludable from each monthly payment made to the husband is 75 percent of \$100, or \$75, and the remaining \$25 of each payment received

by him shall be included in his gross income. After the husband's death, the amount excludable by the second annuitant (the surviving wife) would be 75 percent of each monthly payment of \$50, or \$37.50, and the remaining \$12.50 of each payment shall be included in her gross income.

Example (2). If the same contract were purchased after June 30, 1986, the expected return would be \$22,800, computed as follows:

Multiple from Table VI (ages 70, 67).....	22.0
Multiple from Table V (age 70).....	16.0
Difference (multiple applicable to second annuitant).....	6.0
Portion of expected return, second annuitant (\$600×6.0).....	\$3,600
Plus: Portion of expected return, first annuitant (\$1,200×16.0).....	\$19,200
Expected return under the contract...	\$22,800

If the investment in the contract is \$14,310, the exclusion ratio is $\$14,310 \div \$22,800$, or 62.8 percent. Thus, the husband would exclude \$62.80 of each \$100 payment received by him. After his death, his wife would exclude 62.8 percent, or \$31.40, of each \$50 monthly payment.

Example (3). If amounts were invested in the same contract both before July 1, 1986, and after June 30, 1986, and the election described in § 1.72-6(d)(6) were made, two exclusion ratios would be determined pursuant to § 1.72-6(d). Assume that the husband's total investment in the contract is \$14,310 and that \$7,310 is the pre-July 1986 investment in the contract. The pre-July 1986 exclusion ratio would be $\$7,310 \div \$19,080$, or 38.3 percent. The post-June 1986 exclusion ratio would be $\$7,000 \div \$22,800$, or 30.7 percent. The husband would exclude \$69.00 (\$38.30+\$30.70) of the \$100 monthly payment received by him. The remaining \$31.00 would be included in his gross income. After the husband's death, the amount excludable by his wife would be \$34.50 (38.3 percent of \$50 plus 30.7 percent of \$50). The remaining \$15.50 would be included in gross income.

The same method is used if the payments are to be increased after the death of the first annuitant. Thus, if the payments to be made until the husband's death were \$50 per month and his widow were to receive \$100 per month thereafter until her death, the 7.6 multiple in example (1) above would be applied to the \$100 payments, yielding an expected return with respect to this portion of the annuity contract of \$9,120 (\$1,200×7.6). An expected return of \$7,260 (\$600×12.1) would be obtained with respect to the payments to be made to the husband, yielding a total expected

return under the contract of \$16,380 (\$9,120 plus \$7,260). If payments are to be made quarterly, semiannually, or annually, an appropriate adjustment of the multiples found in Tables I and II or Tables V and VI (whichever are applicable) should be made in accordance with paragraph (a)(2) of this section.

(3) In the case of a joint and survivor annuity contract in respect of which the first annuitant died in 1951, 1952, or 1953, and the basis of the surviving annuitant's interest in the contract was determinable under section 113(a)(5) of the Internal Revenue Code of 1939, such basis shall be considered the "aggregate of premiums or other consideration paid" by the surviving annuitant for the contract. (For rules governing this determination, see 26 CFR (1939) 39.22(b)(2)-2 and 39.113(a)(5)-1 (Regulations 118).) In determining such an annuitant's investment in the contract, such aggregate shall be reduced by any amounts received under the contract by the surviving annuitant before the annuity starting date, to the extent such amounts were excludable from his gross income at the time of receipt. The expected return of the surviving annuitant in such cases shall be determined in the manner prescribed in paragraph (a) of this section, as though the surviving annuitant alone were involved. For this purpose, the appropriate multiple for the survivor shall be obtained from Table I as of the annuity starting date determined in accordance with paragraph (b)(2)(i) of § 1.72-4.

(4) If a contract involving two annuitants provides for fixed monthly payments to be made as a joint life annuity until the death of the first annuitant to die (in other words, only as long as both remain alive), the expected return under such contract shall be determined by multiplying the total of the annuity payments to be received annually under the contract by the multiple obtained from Table IIA or VIA (whichever is applicable) of § 1.72-9 under the ages (as of the annuity starting date) and, if applicable, sexes of the annuitants. If, however, payments are to be made under the contract quarterly, semiannually, or annually, an appropriate adjustment of the multiple found in Table IIA or VIA shall be made in accordance with paragraph (a)(2) of this section.

(5) If a joint and survivor annuity contract involving two annuitants provides that a specified amount shall be paid during their joint lives and a different specified amount shall be paid to the survivor upon the death of

whichever of the annuitants is the first to die, the following preliminary computation shall be made in all cases preparatory to determining the expected return under the contract:

(i) From Table II or VI (whichever is applicable), obtain the multiple under both of the annuitants' ages (as of the annuity starting date) and, if applicable, their appropriate sexes;

(ii) From Table IIA or VIA (whichever is applicable), obtain the multiple applicable to both annuitants' ages (as of the annuity starting date) and, if applicable, their appropriate sexes;

(iii) Apply the multiple found in subdivision (i) of this subparagraph to the total of the amounts to be received annually after the death of the first to die; and

(iv) Apply the multiple found in subdivision (ii) of this subparagraph to the difference between the total of the amounts to be received annually before and the total of the amounts to be received annually after the death of the first to die.

If the original annual payment is in excess of the annual payment to be made after the death of the first to die, the expected return is the sum of the amounts determined under subdivisions (iii) and (iv) of this subparagraph. This may be illustrated by the following examples:

Example (1). A husband purchases a joint and survivor annuity providing for payments of \$100 a month for as long as both he and his wife live, and, after the death of the first to die, payments to the survivor of \$75 a month for life. As of the annuity starting date, his age at his nearest birthday is 70 and that of his wife at her nearest birthday is 67. If there is no post-June 1986 investment in the contract, the expected return under the contract is computed as follows:

Multiple from Table II (male age 70, female age 67).....	19.7
Multiple from Table IIA (male age 70, female age 67).....	9.3
Portion of expected return (\$900×19.7—sum per year after first death).....	\$17,730
Plus: Portion of expected return (\$300×9.3—amount of change in sum at first death).....	\$2,790
Expected return under the contract.....	\$20,520

The total expected return in this example, \$20,520, is to be used in computing the amount to be excluded from gross income. Thus, if the investment in the contract is \$17,887, the exclusion ratio is $\$17,887 \div \$20,520$, or 87.2 percent. The amount excludable from each monthly payment made while both are alive is 87.2 percent of \$100, or \$87.20, and the remaining \$12.80 of each payment shall be included in gross income.

After the death of the first to die, the amount excludable by the survivor shall be 87.2 percent of each monthly payment of \$75, or \$65.40, and the remaining \$9.60 of each payment shall be included in gross income.

Example (2). Assume the same facts as in example (1), except that the contract is purchased after June 30, 1986.

The expected return under the contract is computed as follows:

Multiple from Table VI (ages 70, 67).....	22.0
Multiple from Table VIA (ages 70, 67).....	12.4
Portion of expected return (\$900×22.0—sum per year after first death).....	\$19,800
Plus: Portion of expected return (\$300×12.4—amount of change in sum at first death).....	\$3,720
Expected return under the contract.....	\$23,520

Thus, if the investment in the contract is \$17,887, the exclusion ratio is $\$17,887 \div \$23,520$, or 76.1 percent. The amount excludable from each monthly payment made while both are alive would be 76.1 percent of \$100, or \$76.10, and the remaining \$23.90 of each payment would be included in gross income. After the death of the first to die, the amount excludable by the survivor would be 76.1 percent of each monthly payment of \$75, or \$57.08, and the remaining \$17.92 of each payment would be included in gross income.

Example (3). Assume the same facts as in examples (1) and (2), except that the total investment in the contract is \$17,887, and that the pre-July 1986 investment in the contract is \$8,000. Assume also that one of the annuitants makes the election described in § 1.72-6(d)(6). Separate computations shall be performed pursuant to § 1.72-6(d) to determine the amount excludable from gross income. The pre-July 1986 exclusion ratio would be $\$8,000 \div \$20,520$, or 39 percent. The post-June 1986 exclusion ratio would be $\$9,887 \div \$23,520$, or 42 percent. The amount excludable from each monthly payment made while both are alive would be \$81 $((.39 \times 100) + (.42 \times 100))$, and the remaining \$19 would be included in gross income. After the death of the first to die, the amount excludable by the survivor would be \$60.75 $((.39 \times 75) + (.42 \times 75))$, and the remaining \$14.25 would be included in gross income.

If the original annual payment is less than the annual payment to be made after the death of the first to die, the expected return is the difference between the amounts determined under subdivisions (iii) and (iv) of this subparagraph. If, however, payments are to be made quarterly, semiannually, or annually under the contract, the multiples obtained from both Tables II and IIA or Tables VI and VIA (whichever are applicable) shall first be adjusted in a manner prescribed in paragraph (a)(2) of this section.

(6) If a contract provides for the payment of life annuities to two persons during their respective lives and, after the death of one (without regard to which one dies first), provides that the survivor shall receive for life both his own annuity payments and the payments made formerly to the deceased person, the expected return shall be determined in accordance with paragraph (e)(4) of this section.

(7) If paragraph (b)(3) of § 1.72-2 applies to payments provided under a contract and this paragraph applies to such payments, the principles of this paragraph shall be used in making the computations described in paragraph (d)(3) of § 1.72-4. This may be illustrated by the following examples, examples (1) through (3) of which assume that there is no post-June 1986 investment in the contract:

Example (1). Taxpayer A, a male age 63, pays \$24,000 for a contract which provides that the proceeds (both income and return of capital) from eight units of an investment fund shall be paid monthly to him for his life and that after his death the proceeds from six such units shall be paid monthly to B, a female age 55, for her life. The portion of the investment in the contract allocable to each taxable year of A is \$955.20 and that allocable to each taxable year of B is \$716.40. This is determined in the following manner:

Multiple from Table II (male, age 63, and female, age 55)	28.1
Number of units to be paid, in effect, as a joint and survivor annuity	×6
Number of total annual unit payments anticipatable with respect to the joint and survivor annuity element	168.6
Multiple from Table I (male, age 63)	16.2
Number of units to be paid, in effect, as a single life annuity	×2
Number of total annual unit payments anticipatable with respect to A alone	32.4
Total number of unit payments anticipatable	201
Portion of investment in the contract allocable to unit payments (\$24,000 ÷ 201) on an annual basis	\$119.40
Number of units payable to A while he continues to live	×8
Portion of the investment in the contract allocable to each taxable year of A	\$955.20
Portion of investment in the contract allocable to unit payments (\$24,000 ÷ 201) on an annual basis	\$119.40
Number of units payable to B for her life after A's death	×6

Portion of the investment in the contract allocable to each taxable year of B

\$716.40

For the purpose of the above computation it is immaterial whether or not A lives to or beyond the life expectancy shown for him in Table I.

Example (2). Assume that Taxpayer A in example (1) receives payments for five years which are at least as large as the portion of the investment in the contract allocable to such years, but in the sixth year he receives a total of only \$626.40 rather than the \$955.20 allocable to such year. A is 69 and B is 61 at the beginning of the first monthly period for which an amount is payable in the seventh taxable year. A makes the election in that year provided under paragraph (d)(3) of § 1.72-4. The difference between the portion of the investment in the contract allocable to the sixth year and the amount actually received in that year is \$328.80 (\$955.20 less \$626.40). In this case, 139.2 unit payments are anticipatable (on an annual basis), since the appropriate multiple from Table II of § 1.72-9, 23.2, multiplied by the number of units payable, in effect, as a joint and survivor annuity yields this result (6 × 23.2). A's appropriate multiple from Table I of § 1.72-9 for the two units which will cease to be paid at his death is 12.6, and the total number of unit payments anticipatable (on an annual basis) is, therefore, 164.4 (2 × 12.6 plus 139.2). Dividing the difference previously found (\$328.80) by the total number of unit payments thus determined (164.4) indicates that A will have an additional allocation of the investment in the contract of \$16 to the seventh and every succeeding full taxable year (8 units × \$2), and B will have an additional allocation of the investment in the contract of \$12 (6 units × \$2) to each taxable year in which she receives 12 monthly payments subsequent to the death of A. The total allocable to each taxable year of A is, therefore, \$971.20, and that allocable to each taxable year of B will be \$728.40.

Example (3). If, in example (2), A had died at the end of the fifth year, in the sixth year B would have received a payment of \$469.80 (that portion of the \$626.40 that A would have received which is in the same ratio that 6 units bear to 8 units) and would thus have received \$246.60 less than the portion of the investment in the contract originally determined to be allocable to each of her taxable years. In these circumstances, B would be entitled to elect to redetermine the portion of the investment in the contract allocable to the taxable year of election and all subsequent years. The new amount allocable thereto would be found by dividing the \$246.60 difference by her life expectancy as of the first day of the first period for which she received an amount as an annuity in the seventh year of the annuity contract, and adding the result to her originally determined allocation of \$716.40.

Example (4). On July 1, 1986, Taxpayer C, age 60, pays \$28,000 for a contract which provides that the proceeds (both income and return of capital) from 10 units of an investment fund shall be paid monthly to C for C's life and that after C's death the

proceeds from 4 such units shall be paid monthly to D, age 57, for D's life. The portion of the investment in the contract allocable to each taxable year of C is \$1,037.00 and that allocable to each taxable year of D is \$414.80. This is determined as follows:

Multiple from Table VI (ages 60, 57)	31.2
Number of units to be paid, in effect, as a joint and survivor annuity	×4
Number of total annual unit payments anticipatable with respect to the joint and survivor annuity element	124.8
Multiple from Table V (age 60)	24.2
Number of units to be paid, in effect, as a single life annuity	×6
Number of total annual unit payments anticipatable with respect to C alone	145.2
Total number of unit payments anticipatable	270
Portion of investment in the contract allocable to unit payments (\$28,000 ÷ 270) on an annual basis	103.70
Number of units payable to C while C continues to live	×10
Portion of the investment in the contract allocable to each taxable year of C	\$1,037.00
Portion of investment in the contract allocable to unit payments (\$28,000 ÷ 270) on an annual basis	\$103.70
Number of units payable to D for D's life after C's death	×4
Portion of the investment in the contract allocable to each taxable year of D	\$414.80

For purposes of the above computation it is immaterial whether or not C lives to or beyond the life expectancy shown in Table V.

Example (5). Assume the same facts as in example (4), except that C's total investment in the contract is \$28,000, and C's pre-July 1986 investment in the contract is \$16,000. If C makes the election described in § 1.72-6(d)(6), separate computations are required to determine the amount excludable from gross income with respect to the pre-July 1986 investment in the contract and the post-June 1986 investment in the contract. The annuitant shall apply the appropriate pre-July 1986 and post-June 1986 life expectancy multiples to the applicable portions of the units to be paid as a joint and survivor annuity, and as a single life annuity.

Pre-July 1986 Computation (all references to unit payments are to the pre-July 1986 applicable portion of such payments):

Multiple from Table II (male, age 60, female, age 57)	27.6
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Number of units to be paid, in effect, as a joint and survivor annuity.....	×4	
Number of total annual unit payments anticipatable with respect to the joint and survivor annuity element.....		110.40
Multiple from Table I (male, age 60).....	18.2	
Number of units to be paid, in effect, as a single life annuity.....	×6	
Number of total annual unit payments anticipatable with respect to C alone.....		109.20
Total number of unit payments anticipatable.....		219.6
Portion of pre-July 1986 investment in the contract allocable to unit payments (\$16,000 ÷ 219.60) on an annual basis.....		\$72.86
Number of units payable to C while C continues to live.....	×10	
Portion of pre-July 1986 investment in the contract allocable to each taxable year of C.....		728.60
Portion of pre-July 1986 investment in the contract allocable to unit payments (\$16,000 ÷ 219.60) on an annual basis.....		72.86
Number of units payable to D for D's life after C's death.....	×4	
Portion of pre-July 1986 investment in the contract allocable to each taxable year of D.....		\$291.44

Post-June 1986 Computation (all references to unit payments are to the post-June 1986 applicable portion of such payments):

Multiple from Table VI (ages 60, 57).....	31.2	
Number of units to be paid, in effect, as a joint and survivor annuity.....	×4	
Number of total annual unit payments anticipatable with respect to the joint and survivor annuity element.....		124.80
Multiple from Table V (age 60).....	24.2	
Number of units to be paid, in effect, as a single life annuity.....	×6	
Number of total annual unit payments anticipatable with respect to C alone.....		145.20
Total number of unit payments anticipatable.....		270
Portion of post-June 1986 investment in the contract allocable to unit payments (\$12,000 ÷ 270) on an annual basis.....		\$44.44
Number of units payable to C while C continues to live.....	×10	

Portion of post-June 1986 investment in the contract allocable to each taxable year of C..... **\$444.40**

Portion of post-June 1986 investment in the contract allocable to unit payments (\$12,000 ÷ 270) on an annual basis..... **44.44**

Number of units payable to D for D's life after C's death..... **×4**

Portion of post-June 1986 investment in the contract allocable to each taxable year of D..... **\$177.78**

Total computation:

Total portion of the investment in the contract allocable to each taxable year of C (\$728.60 + \$444.40)..... **\$1,173.00**

Total portion of the investment in the contract allocable to each taxable year of D (\$291.44 + \$177.78)..... **\$469.22**

Example (6). Assume that taxpayer C in example (4) receives payments for four years which are at least as large as the portion of the investment in the contract allocable to such years, but in the fifth year receives a total of only \$600 rather than the \$1,037 allocable to such year. C is 65 and D is 62 at the beginning of the first monthly period for which an amount is payable in the sixth taxable year. C makes the election in that year provided under paragraph (d)(3) of § 1.72-4. The difference between the portion of the investment in the contract allocable to the fifth year and the amount actually received in that year is \$437 (\$1,037 - \$600). In this case, 106 unit payments are anticipatable with respect to the joint and survivor annuity element, since the appropriate multiple from Table VI of § 1.72-9, 26.5, multiplied by the number of units payable, in effect, as a joint and survivor annuity yields this result (4 × 26.0). C's appropriate multiple from Table V of § 1.72-9 for the six units which will cease to be paid at C's death is 20.0, and the number of unit payments anticipatable with respect to C alone is 120 (6 × 20). The total number of unit payments anticipatable is, therefore, 226 (120 plus 106). Dividing the difference previously found (\$437) by the total number of unit payments thus determined (226) indicates that C will have an additional allocation of the investment in the contract of \$1.93 to the sixth and every succeeding full taxable year (10 units × \$1.93), and D will have an additional allocation of the investment in the contract of \$7.72 (4 units × \$1.93) to each taxable year in which D receives 12 monthly payments subsequent to the death of C. The total allocable to each taxable year of C is, therefore, \$1,056.30, and that allocable to each taxable year of D will be \$422.52.

Example (7). If, in example (6), C had died at the end of the fourth year, in the fifth year D would have received a payment of \$240 (that portion of the \$600 that C would have received which is in the same ratio that 4 units bear to 10 units) and would thus have received \$174.80 less than the portion of the

investment in the contract allocable to each of D's taxable years. In these circumstances, D would be entitled to elect to redetermine the portion of the investment in the contract allocable to the taxable year of election and all subsequent years. The new amount allocable thereto would be found by dividing the \$174.80 difference by D's life expectancy as of the first day of the first period for which D received an amount as an annuity in the sixth year of the annuity contract, and adding the result to D's originally determined allocation of \$414.80.

(e) *Expected return where two or more annuity elements providing for fixed payments are acquired for a single consideration.* (1) In the case of a contract described in paragraph (a)(2) of § 1.72-2, which provides for specified payments to be made under two or more annuity elements, the expected return shall be found for the contract as a whole by aggregating the expected returns found with respect to each annuity element. If individual life annuity elements are involved (including joint and survivor annuities where the primary annuitant died before January 1, 1954) the expected return for each of them shall be determined in the manner prescribed in paragraph (a) of this section. If joint and survivor annuity elements are involved, the expected return for such elements shall be determined under the appropriate subparagraph of paragraph (b) of this section. If terms certain or amounts certain are involved, the expected returns for such elements shall be determined under paragraph (c) or (d) of this section, respectively.

(2) The aggregate expected return found in accordance with the rules set forth in subparagraph (1) of this paragraph shall constitute the expected return for the contract as a whole. The investment in the contract shall be divided by the amount thus determined to obtain the exclusion ratio for the contract as a whole. This exclusion ratio shall be applied to all amounts received as a annuity under the contract by any recipient (in accordance with the provisions of § 1.72-4), except in the case of amounts received by a surviving annuitant under a joint and survivor annuity element to which the provisions of section 72(i) and paragraph (b)(3) of this section would apply if it were a separate contract. See subparagraph (3) of this paragraph.

(3) In the case of a contract providing two or more annuity elements, one of which is a joint and survivor annuity element of the type described in section 72(i) and paragraph (b)(3) of this section, the general exclusion ratio for the contract as a whole, for the purpose of

computations with respect to all the other annuity elements shall be determined in accordance with the principles of subparagraphs (1) and (2) of this paragraph. A special exclusion ratio shall thereafter be determined for the surviving annuitant receiving payments under the annuity element described in section 72(i) and paragraph (b)(3) of this section by using the investment in the contract and the expected return determined in accordance with the provisions of paragraph (b)(3) of this section.

(4) In the case of a contract providing for payments to be made to two persons in the manner described in paragraph (b)(6) of this section, the expected return is to be computed as though there were two joint and survivor annuities under the same contract, in the following manner. First, the multiple appropriate to the ages (as of the annuity starting date) and, if applicable, sexes of the annuitants involved shall be found in Table II or VI (whichever is applicable) of § 1.72-9 and adjusted, if necessary, in the manner described in paragraph (a)(2) of this section. Second, the multiple so found shall be applied to the sum of the payments to be made each year to both annuitants. The result is the expected return for the contract as a whole.

(5) For rules relating to expected return where two or more annuity elements are acquired for a single consideration and one or more of such elements does not specify a fixed payment for each period, see paragraph (f) of this section.

(g) *Expected return with respect to contracts subject to § 1.72-6(d).* In the case of a contract to which § 1.72-6(d) (relating to contracts in which amounts were invested both before July 1, 1986, and after June 30, 1986) applies, an expected return is computed using the multiples in Tables I through IV of § 1.72-9 with respect to the pre-July 1986 investment in the contract and a second expected return is computed using the multiples in Tables V through VIII of § 1.72-9 with respect to the post-June 1986 investment in the contract.

Par. 4. Section 1.72-6 is amended by revising paragraph (b) and adding a new paragraph (d) to read as follows:

§ 1.72-6 Investment in the contract.

(b) *Allocation of the investment in the contract where two or more annuity elements are acquired for a single consideration.* (1) In the case of a contract described in § 1.72-2(a)(2) which provides for two or more annuity elements, the investment in the contract

determined under paragraph (a) shall be allocated to each of the annuity elements in the ratio that the expected return under each annuity element bears to the aggregate of the expected returns under all the annuity elements. The exclusion ratio for the contract as a whole shall be determined by dividing the investment in the contract (after adjustment for the present value of any or all refund features) by the aggregate of the expected returns under all the annuity elements. This may be illustrated by the following examples:

Example (1). If a contract provides for annuity payments of \$1,000 per year for life (with no refund feature) to both A and B, a male and female, respectively, each 70 years of age as of the annuity starting date, such contract is acquired for consideration of \$19,575 (without regard to whether paid by A, B, or both), and there is no post-June 1986 investment in the contract, the investment in the contract shall be allocated by determining the exclusion ratio for the contract as a whole in the following manner:

Expectancy of A under Table I and § 1.72-5(a)(2), 11.6 (12.1-0.5), multiplied by \$1,000.....	\$11,600
Plus: Expectancy of B computed in a similar manner (\$1,000 × 14.5 [15.0-0.5])	14,500
Total expected return.....	26,100

The exclusion ratio for both A and B is then $\$19,575 \div \$26,100$, or 75 percent. A and B shall each exclude from gross income three-fourths (\$750) of each \$1,000 annual payment received and shall include the remaining one-fourth (\$250) of each \$1,000 annual payment received in gross income.

Example (2). Assume the same facts as in example (1) except that of the total investment in the contract of \$19,575, the pre-July 1986 investment in the contract is \$10,000. If the election described in § 1.72-6(d)(6) is made with respect to the contract, the investment in the contract shall be allocated by determining an exclusion ratio for the contract as a whole based on separately computed exclusion ratios with respect to the pre-July 1986 investment in the contract and the post-June 1986 investment in the contract in the following manner:

Expectancy of A under Table I and § 1.72-5(a)(2), 11.6 (12.1-0.5), multiplied by \$1,000.....	\$11,600
Plus: Expectancy of B under Table I and § 1.72-5(a)(2), 14.5 (15.0-0.5), multiplied by \$1,000.....	14,500
Pre-July 1986 expected return.....	\$26,100
Expectancy of A under Table V and § 1.72-5(a)(2), 15.5 (16.0-0.5), multiplied by \$1,000.....	\$15,500
Plus: Expectancy of B under Table V and § 1.72-5(a)(2), 15.5 (16.0-0.5), multiplied by \$1,000.....	15,500
Post-June 1986 expected return.....	\$31,000

Pre-July 1986 exclusion ratio (\$10,000 ÷ \$26,100).....	38.3
Post-June 1986 exclusion ratio (\$9,575 ÷ 31,000).....	30.9

A and B shall each exclude from gross income \$692 (38.3 percent of \$1,000 + 30.9 percent of \$1,000) of each \$1,000 payment and include the remaining \$308 in gross income.

(2) In the case of a contract providing for specified annual annuity payments to be made to two persons during their joint lives and the payment of the aggregate of the two individual payments to the survivor for his life, the investment in the contract shall be allocated in accordance with the provisions of subparagraph (1) of this paragraph. For this purpose, the investment in the contract (without regard to the fact that differing amounts may have been contributed by the two annuitants) shall be divided by the expected return determined in accordance with paragraph (e)(4) of § 1.72-5. The resulting exclusion ratio shall then be applied to any amounts received as an annuity by either annuitant.

(3) In the case of a contract providing two or more annuity elements, one or more of which provides for payments to be made in a manner described in paragraph (b)(3) of § 1.72-2, the investment in the contract shall be allocated to the various annuity elements in the following manner.

(i) If all the annuity elements provide for payments to be made in the manner described in paragraph (b)(3) of § 1.72-2, the investment in the contract shall be allocated on the basis of the amounts received by each recipient by apportioning the amount determined to be excludable under that section to each recipient in the same ratio as the total of the amounts received by him in the taxable year bears to the total of the amounts received by all recipients during the same period; and

(ii) If one or more, but not all, of the annuity elements provide for payments to be made in a manner described in paragraph (b)(3) of § 1.72-2:

(a) With respect to all annuity elements to which that section does not apply, the investment in the contract for all such elements shall be the portion of the investment in the contract as a whole (found in accordance with the provisions of this section) which is properly allocable to all such elements; and

(b) With respect to all annuity elements to which paragraph (b)(3) of

§ 1.72-2 does apply, the investment in the contract for all such elements shall be the investment in the contract as a whole (found in accordance with the provisions of this section) as reduced by the portion thereof determined under (a) of this subdivision.

For the purpose of determining, pursuant to (a) of this subdivision, the portion of the investment in the contract as a whole properly allocable to a particular annuity element, reference shall be made to the present value of such annuity element determined in accordance with paragraph (e)(1)(iii) (b) of § 1.101-2.

(iii) In the case of a contract to which paragraph (d) of this section applies, this paragraph (b) is applied in the manner prescribed in paragraph (d) and, in particular, paragraph (d)(5)(v) of this section.

(d) *Pre-July 1986 and post-June 1986 investment in the contract.* (1) This paragraph (d) applies to an annuity contract if—

(i) The investment in the contract includes a pre-July 1986 investment in the contract and a post-June 1986 investment in the contract (both as defined in § 1.72-6(d)(3));

(ii) The use of a multiple found in Tables I through VIII of § 1.72-9 is required to determine the expected return under the contract; and

(iii) The election described in paragraph (d)(6) of this section is made with respect to the contract.

(2) In the case of annuity contract to which this paragraph (d) applies—

(i) All computations required to determine the amount excludable from gross income shall be performed separately with respect to the pre-July 1986 investment in the contract and the post-June 1986 investment in the contract as if each such amount were the entire investment in the contract;

(ii) The multiples in Tables I through IV shall be used for computations involving the pre-July 1986 investment in the contract and the multiples in Tables V through VIII shall be used for computations involving the post-June 1986 investment in the contract; and

(iii) The amount excludable from gross income shall be the sum of the amounts determined under the separate computations required by paragraph (d)(2)(i) of this section.

(3) For purposes of the regulations under section 72, the pre-July 1986 investment in the contract and post-June 1986 investment in the contract are determined in accordance with the following rules:

(i) (A) Except as provided in § 1.72-9, if the annuity starting date of the contract occurs before July 1, 1986, the pre-July 1986 investment in the contract is the total investment in the contract as of the annuity starting date;

(B) Except as provided in § 1.72-9, if the annuity starting date of the contract occurs after June 30, 1986, and the contract does not provide for a disqualifying form of payment or settlement, the pre-July 1986 investment in the contract is the investment in the contract computed as of June 30, 1986, as if June 30, 1986, had been the later of the annuity starting date of the contract or the date on which an amount is first received thereunder as an annuity;

(C) If the annuity starting date of the contract occurs after June 30, 1986, and the contract provides, at the option of the annuitant or of any other person (including, in the case of an employee's annuity, an option exercisable only by, or with the consent of, the employer), for a disqualifying form of payment or settlement, the pre-July 1986 investment in the contract is zero (i.e., the total investment in the contract is post-June 1986 investment in the contract).

(ii) The post-June 1986 investment in the contract is the amount by which the total investment in the contract as of the annuity starting date exceeds the pre-July 1986 investment in the contract.

(iii) For purposes of paragraph (d)(3)(i) of this section, a disqualifying form of payment or settlement is any form of payment or settlement (whether or not selected) that permits the receipt of amounts under the contract in a form other than a life annuity. For example, each of the following options provides for a disqualifying form of payment or settlement:

(A) An option to receive a lump sum in full discharge of the obligation under the contract.

(B) An option to receive an amount under the contract after June 30, 1986, and before the annuity starting date.

(C) An option to receive an annuity for a period certain.

(D) An option to receive payments under a refund feature (within the meaning of paragraphs (b) and (c) of this section) that is substantially equivalent to an annuity for a period certain.

(E) An option to receive a temporary life annuity (within the meaning of § 1.72-5 (a)(3)) that is substantially equivalent to an annuity for a period certain.

An option to receive alternative forms of life annuity is not a disqualifying option for purposes of paragraph (d)(3)(i) of this section. Thus, if the sole options provided under a contract are a single life annuity and a joint and survivor life

annuity, paragraph (d)(3)(i) (C) of this section does not apply to such contract.

(iv) For purposes of paragraph (d)(3)(iii) of this section, a refund feature is substantially equivalent to an annuity for a period certain if its value determined under Table VII of § 1.72-9 exceeds 50 percent. Similarly, a temporary life annuity is substantially equivalent to an annuity for a period certain if the multiple determined under Table VIII of § 1.72-9 exceeds 50 percent of the maximum duration of the annuity.

(4) In any separate computation under this paragraph (d), only the applicable portion of other amounts (such as the total expected return under the contract, or the total amount guaranteed under the contract as of the annuity starting date) shall be taken into account if the use of the entire amount in such computation is inconsistent with the use in the computation of only a portion of the investment in the contract. For example, such use is generally inconsistent if the computation requires a comparison of the investment in the contract and such other amount for the purpose of using the greater (or lesser) amount or the difference between the two. For purposes of the first sentence of this paragraph (d)(4), the applicable portion is the amount that bears the same ratio to the entire amount as the pre-July 1986 investment in the contract or the post-June 1986 investment in the contract, whichever is applicable, bears to the total investment in the contract as of the annuity starting date.

(5) *Application to particular computations.* (i) In the case of a contract to which this paragraph (d) applies, the exclusion ratio for purposes of § 1.72-4 (a) is the sum of the exclusion ratios separately computed in accordance with this paragraph (d). The exclusion ratio with respect to the pre-July 1986 investment in the contract is determined by dividing the pre-July 1986 investment in the contract by the expected return as found under § 1.72-5 by applying the appropriate multiples of Tables I through IV of § 1.72-9. Similarly, the exclusion ratio with respect to the post-June 1986 investment in the contract is determined by dividing the post-June 1986 investment in the contract by the expected return as found under § 1.72-5 by applying the appropriate multiples in Tables V through VIII of § 1.72-9.

(ii) The applicability of § 1.72-4(d)(2) to a contract to which this paragraph (d) applies shall be determined separately with respect to the post-June 1986 investment in the contract and the pre-July 1986 investment in the contract and

in each such determination only the applicable portion of the total expected return under the contract shall be taken into account. If § 1.72-4(d)(2) applies with respect to either such investment in the contract, the separately computed exclusion ratio shall be considered to be the applicable portion of 100 percent.

(iii) If § 1.72-4(d)(3) applies to a contract to which this paragraph (d) applies—

(A) The applicable portions (as defined in paragraph (d)(4) of this section) of payments received under the contract for a taxable year shall be separately computed;

(B) The pre-July 1986 investment in the contract and the post-June 1986 investment in the contract shall be separately allocated to the taxable year; and

(C) The separate applicable portions of the payments received under the contract for the taxable year shall be considered to be amounts received as an annuity (for which the exclusion ratio is 100 percent) only to the extent they do not exceed the portions of the corresponding investments in the contract which are properly allocable to that year.

See the example in § 1.72-4(d)(3)(v).

(iv) If § 1.72-4(e) applies to a contract to which this paragraph (d) applies, the exclusion ratio shall be separately computed with respect to the pre-July 1986 investment in the contract and the post-June 1986 investment in the contract. For purposes of the separate computations under § 1.72-4(e)(2)(ii), only the applicable portion of payments received shall be taken into account and the exclusion ratio (100%) shall be applied to the separately computed portion allocated to each participant.

(v) If paragraph (b)(3) of this section applies to a contract to which this paragraph (d) applies, separate allocations are required with respect to the pre-July 1986 investment in the contract and the post-June 1986 investment in the contract. For purposes of the separate computations required to determine the portion of the investment in the contract properly allocable to a particular annuity element, only the applicable portion of the present value of the annuity element determined in accordance with § 1.101-2(e)(1)(iii)(b) is taken into account.

(vi) If § 1.72-7 applies to a contract to which this paragraph (d) applies, separate computations are required to determine the adjustment to the pre-July 1986 investment in the contract and the post-June 1986 investment in the contract. For purposes of such separate

computations, only the applicable portions of the amounts described in § 1.72-7 (b)(3)(ii), (c)(1)(ii)(B), (c)(2)(vii)(B), and (d)(1)(ii) are taken into account. Similarly, in the case of computations with respect to the guarantee of a specified amount under § 1.72-7(d)(1), only the applicable portion of such amount is taken into account.

(6) This paragraph (d) applies to a contract only if the first taxpayer to receive an amount as an annuity under the contract elects to perform separate computations with respect to the pre-July 1986 investment in the contract and the post-June 1986 investment in the contract as if each such amount were the entire investment in contract. If two or more annuitants receive an amount as an annuity under the contract at the same time (such as under a joint-and-last-survivorship annuity contract), an election by one of the annuitants is treated as an election by each of the annuitants. The election is made by attaching a statement to the first return filed by the taxpayer for the first taxable year in which an amount is received as an annuity under the contract. The statement must indicate that the taxpayer is electing to apply the provisions of paragraph (d) of § 1.72-6, and must also contain the name, address, and taxpayer identification number of each annuitant under the contract, and the amount of the pre-July 1986 investment in the contract.

(7) If the investment in the contract includes a post-June 1986 investment in the contract and the election described in paragraph (d)(6) of this section is not made—

(i) The amount excludable from gross income shall be determined without regard to the separate computations described in this paragraph (d); and

(ii) Only the multiples found in Tables V through VIII shall be used in determining the amount excludable from gross income.

Par. 5. Section 1.72-7 is amended by revising paragraphs (b), (c), (d), and (e), and adding a new paragraph (f) to read as follows:

§ 1.72-7 Adjustment in investment where a contract contains a refund feature.

(b) *Adjustment of investment for the refund feature in the case of a single life annuity.* Where a single life annuity contract to which section 72 applies contains a refund feature and the special rule of paragraph (d) of this section does not apply, the investment in the contract shall be adjusted in the following manner:

(1) Determine the number of years necessary for the guaranteed amount to be fully paid by dividing the maximum amount guaranteed as of the annuity starting date by the amount to be received annually under the contract to the extent such amount reduces the guaranteed amount. The number of years should be stated in terms of the nearest whole year, considering for this purpose a fraction of one-half or more as an additional whole year.

(2) Consult Table III or VII (whichever is applicable) of § 1.72-9 for the appropriate percentage under the whole number of years found in subparagraph (1) of this paragraph and the age (as of the annuity starting date) and, if applicable, sex of the annuitant.

(3) Multiply the percentage found in subparagraph (2) of this paragraph by whichever of the following is the smaller: (i) The investment in the contract found in accordance with § 1.72-6 or (ii) the total amount guaranteed as of the annuity starting date.

(4) Subtract the amount found in subparagraph (3) of this paragraph from the investment in the contract found in accordance with § 1.72-6.

The resulting amount is the investment in the contract adjusted for the present value of the refund feature without discount for interest and is to be used in determining the exclusion ratio to be applied to the payments received as an annuity. The percentage found in Tables III or VII shall not be adjusted in a manner described in paragraph (a)(2) of § 1.72-5. These principles may be illustrated by the following examples:

Example (1). On January 1, 1954, a husband, age 65, purchased for \$21,053, an immediate installment refund annuity payable \$100 per month for life. The contract provided that in the event the husband did not live long enough to recover the full purchase price, payments were to be made to his wife until the total payments under the contract equaled the purchase price. The investment in the contract adjusted for the purpose of determining the exclusion ratio is computed in the following manner:

Cost of the annuity contract (investment in the contract, unadjusted)	\$21,053
Amount to be received annually ..	\$1,200
Number of years for which payment guaranteed (\$21,053 divided by \$1,200)	17.5
Rounded to nearest whole number of years	18
Percentage located in Table III for age 65 (age of the annuitant as of the annuity starting date) and 18 (the number of whole years) (percent)	30

Subtract value of the refund feature to the nearest dollar (30 percent of \$21,053).....	\$6,316
Investment in the contract adjusted for the present value of the refund feature without discount for interest	\$14,737

Example (2). Assume the same facts as in example (1), except that the total investment in the contract was made after June 30, 1986. The investment in the contract adjusted for the purpose of determining the exclusion ratio is computed as follows:

Cost of the annuity contract (investment in the contract, unadjusted)	\$21,053
Amount to be received annually..	\$1,200
Number of years for which payment guaranteed (\$21,053 ÷ \$1,200).....	17.5
Rounded to nearest whole number of years	18
Percentage in Table VII for age 65 and 18 years (percent).....	15
Subtract value of the refund feature to the nearest dollar (15 percent of \$21,053).....	\$3,158
Investment in the contract adjusted for the present value of the refund feature without discount for interest	\$17,895

Example (3). Assume the same facts as in example (1), except that the pre-July 1986 investment in the contract is \$10,000 and the post-June 1986 investment in the contract is \$11,053. If the annuitant makes the election described in § 1.72-6(d)(6), separate computations must be performed pursuant to § 1.72-6(d) to determine the adjusted investment in the contract. The pre-July 1986 investment in the contract and the post-June 1986 investment in the contract adjusted for the purpose of determining the exclusion ratios are, respectively, \$7,000 and \$9,395, determined as follows:

Pre-July 1986 investment in the contract (unadjusted).....	\$10,000
Pre-July 1986 portion of the amount to be received annually (\$10,000/\$21,053 × \$1,200)....	\$570.00
Number of years for which payment guaranteed (\$10,000 ÷ \$570).....	17.50
Rounded to nearest whole number of years	18
Percentage in Table III for age 65 and 18 years (percent).....	30
Subtract value of the refund feature to the nearest dollar (30 percent of \$10,000).....	\$3,000
Pre-July 1986 investment in the contract adjusted for the present value of the refund feature without discount for interest.....	\$7,000

Post-June 1986 investment in the contract (unadjusted).....	\$11,053
Post-June 1986 portion of the amount to be received annually (\$11,053/\$21,053 × \$1,200)....	\$630
Number of years for which payment guaranteed (\$11,053 ÷ \$630).....	17.54
Rounded to nearest whole number of years	18
Percentage in Table VII for age 65 and 18 years (percent).....	15
Subtract value of the refund feature to the nearest dollar (15 percent of \$11,053).....	\$1,658
Post-June 1986 investment in the contract adjusted for the present value of the refund feature without discount for interest.....	\$9,395

If, in the above examples, the guaranteed amount had exceeded the investment in the contract (or applicable portion thereof), the percentage found in Table III or VII (whichever is

applicable) should have been applied to the lesser of these amounts since any excess of the guaranteed amount over the investment in the contract (as found under § 1.72-6) would not have constituted a refund of premiums or other consideration paid. In such a case, however, a different multiple might have been obtained from Table III or VII (whichever is applicable) since the number of years for which payments were guaranteed would have been greater.

(c) *Adjustment of investment for the refund feature in the case of a joint and survivor annuity.* (1) Except as provided in paragraph (c)(2) of this section, if a joint and survivor annuity contract described in paragraph (b) (1), (2) or (6) of § 1.72-5 contains a refund feature and the special rule of paragraph (d) of this section does not apply, the investment in the contract shall be adjusted in the following manner:

(i) Find the percentage determined under the following formula:

$$V = \frac{\sum_{t=0}^{N-1} \frac{d_{x+t}}{l_x} \left[(N - \frac{1}{2} - t) - P \left(\frac{T_{y+t+1} - T_{y+t+M+1}}{l_y} \right) \right]}{N}$$

In which:

V = The percentage, rounded to the nearest whole percent,

x = The age at the nearest birthday of the primary annuitant,

y = The age at the nearest birthday of the survivor annuitant,

N = The guaranteed amount divided by the annual annuity payable to the primary annuitant, rounded to the nearest integer,

P = The annual annuity continued to the survivor annuitant divided by the annual annuity payable to the primary annuitant,

$$M = \frac{N - \frac{1}{2} - t}{P}$$

l_x = The number of survivors at age x,

$d = l_x - l_{x+1}$, and

$$T_x = \sum_{s=0}^{\infty} \frac{1}{2} (l_{x+s} + l_{x+s+1})$$

(ii) Multiply the percentage found in paragraph (c)(1)(i) of this section by the lesser of (A) the investment in the contract found in accordance with § 1.72-6, or (B) the total amount guaranteed as of the annuity starting date.

(iii) Subtract the amount found in paragraph (c)(1)(ii) of this section from the investment in the contract found in accordance with § 1.72-6.

In the case of a contract providing for payments to be made to two persons in the manner described in paragraph (b)(6) of § 1.72-5, this paragraph (c)(1) is

applied as though the older person were the primary annuitant and the younger person were the survivor annuitant. For purposes of this paragraph (c)(1), the number of survivors at age x (I_x) is determined under the following table:

x	I_x
5	1000000
6	999729
7	999493
8	999284
9	999069
10	998849
11	998620
12	998382
13	998135
14	997876
15	997606
16	997322
17	997025
18	996714
19	996387
20	996044
21	995684
22	995304
23	994905
24	994484
25	994041
26	993573
27	993080
28	992563
29	992024
30	991461
31	990876
32	990269
33	989638
34	988984
35	988303
36	987593
37	986846
38	986055
39	985210
40	984298
41	983310
42	982230
43	981046
44	979742
45	978302
46	976709
47	974945
48	972992
49	970832
50	968447
51	966000
52	963313
53	960375
54	957175
55	953705
56	949954
57	945912
58	941568
59	936908
60	931903
61	926451
62	920540
63	914090
64	907011
65	899221
66	890428
67	880797
68	870298
69	858904
70	846585
71	832316
72	816861
73	800078
74	781837
75	762012
76	740743
77	717689
78	692780
79	665977
80	637260
81	607339
82	575531
83	541919
84	506647
85	469931
86	432459
87	394138
88	355383

x	I_x
89	316712
90	278663
91	242020
92	207150
93	174602
94	144828
95	118151
96	94871.7
97	74863.6
98	58042.2
99	44176.1
100	32956.4
101	24044.8
102	17104.1
103	11815.5
104	7886.75
105	5054.94
106	3086.95
107	1778.82
108	955.465
109	470.955
110	208.668
111	80.7899
112	26.2340
113	6.69620
114	1.19385
115	.111460

(2) If the multiples in Tables I through IV of § 1.72-9 are used to determine any portion of the expected return under a contract described in paragraph (c)(1) of this section, only the post-June 1986 investment in the contract (if any) shall be adjusted in the manner described in paragraph (c)(1) of this section, and the pre-July 1986 investment in the contract shall, in the case of a contract described in paragraph (b) (1) or (6) of § 1.72-5, be adjusted in the following manner:

(i) Determine the number of years necessary for the guaranteed amount to be fully paid by dividing the maximum amount guaranteed as of the annuity starting date by the amount to be received annually under the contract. The number of years should be stated in terms of the nearest whole year, considering for this purpose a fraction of one-half or more as an additional whole year.

(ii) Consult Table III of § 1.72-9 for the appropriate percentages under the whole number of years found in subdivision (i) of this subparagraph and the age (as of the annuity starting date) and sex of each annuitant. If the annuitants are not of the same sex, substitute for the female annuitant a male annuitant 5 years younger, or for the male annuitant a female annuitant 5 years older, so that Table III will be entered in both cases with the ages of annuitants of the same sex.

(iii) Find the sum of the two percentages found in accordance with subdivision (ii) of this subparagraph.

(iv) To the age of the elder of the two annuitants (as determined under subdivision (ii) of this subparagraph), add the number of years (indicated in the table below) opposite the number of years by which such annuitants' ages differ:

Number of years difference in age (2 male annuitants or 2 female annuitants)	Addition to older age in years
0 to 1, inclusive	9
2 to 3, inclusive	8
4 to 5, inclusive	7
6 to 8, inclusive	6
9 to 11, inclusive	5
12 to 15, inclusive	4
16 to 20, inclusive	3
21 to 27, inclusive	2
28 to 42, inclusive	1
Over 42	0

(v) Consult Table III for the appropriate percentage under the whole number of years found in subdivision (i) of this subparagraph and the age and sex of the elder annuitant as adjusted under subdivision (iv) of this subparagraph.

(vi) Subtract the percentage obtained in subdivision (v) of this subparagraph from the sum of the percentages found under subdivision (iii) of this subparagraph. If the result is less than one, subdivisions (vii) and (viii) of this subparagraph shall be disregarded and no adjustment made to the investment in the contract.

(vii) Multiply the percentage found in subdivision (vi) of this subparagraph by whichever of the following is the smaller: (A) the investment in the contract found in accordance with § 1.72-6 or (B) the total amount guaranteed as of the annuity starting date.

(viii) Subtract the amount found in subdivision (vii) of this subparagraph from the investment in the contract found in accordance with § 1.72-6.

(3) The principles of this paragraph (c) may be illustrated by the following examples:

Example (1). Prior to July 1, 1986, Taxpayer A, a 70-year-old male, purchases a joint and last survivor annuity for \$33,050. The contract provides for payments of \$100 a month to be paid first to himself for life and then to B, his 40-year-old daughter, if she survives him. The contract further provides that in the event both die before ten years' payments have been made, payments will be continued to C, a beneficiary, or to C's estate, until ten years' payments have been made. If there is no post-June 1986 investment in the contract, the investment in the contract adjusted for the purpose of determining the exclusion ratio is computed in the following manner:

Cost of the annuity contract (investment in the contract unadjusted)	\$33,050
Guaranteed amount (\$1,200 × 10)	\$12,000

Percentage in Table III for male, age 70 (or female, age 75) for duration of the guarantee (10).

Percentage in Table III for female, age 40 (or male, age 35) for duration of the guarantee (10).....	2
Sum of percentages obtained.....	23
Difference in years of age between two males, aged 70 and 35 (or 2 females, aged 75 and 40).....	35
Addition, in years, to older age....	1
Percentage in Table III for male one year older than A.....	22
Difference between percentages obtained (23 percent less 22 percent).....	1
Value of the refund feature to the nearest dollar (1 percent of \$12,000).....	\$120
Investment in the contract adjusted for present value of the refund feature.....	\$32,930

Example (2). The facts are the same as in example (1), except that the total investment in the contract was made after June 30, 1986, A is 73 years of age, and B is A's 70 year old spouse. The percentage determined under the formula in paragraph (c)(1)(i) of this section is two percent. Thus, the amount determined under paragraph (c)(1)(ii) of this section is \$240 (2 percent of \$12,000), and the investment in the contract adjusted for the present value of the refund feature is \$32,810 (\$33,050—\$240).

(4) If an annuity described in paragraph (b) of § 1.72-5 contains a refund feature and the manner of determining the adjustment to the investment in the contract (or to any part of such investment) is not prescribed or requires use of the formula in paragraph (c)(1)(i) of this section, the Commissioner will determine the amount of the adjustment upon request. The request must contain the date of birth of each annuitant, the guaranteed amount, the annual annuity payable to each annuitant, and the annuity starting date. Send the request to the Commissioner of Internal Revenue, Attention: OP:EP:GA, Washington, D.C. 20224.

(d) *Adjustment of investment in the contract where paragraph (b)(3) of § 1.72-2 applies to payments.* (1) If paragraph (b)(3) of § 1.72-2 applies to payments to be made under a contract and this section also applies because of the provision for a refund feature, an adjustment shall be made to the investment in the contract in accordance with this paragraph before making the computations required by paragraph (d)(3) of § 1.72-4 and paragraph (d)(7) of § 1.72-5. In the case of the guarantee of

a specified amount, the adjustment shall be made by applying the appropriate multiple from Table III or VII (whichever is applicable), as otherwise determined under this section, to the investment in the contract or the guaranteed amount, whichever is the lesser. The guarantee period shall be found by dividing the amount guaranteed by the amount determined by placing the payments received during the first taxable year (to guaranteed amount) on an annual basis. Thus, if monthly payments are first received by a taxpayer on a calendar year basis in August, his total payments (to the extent that they reduce the guaranteed amount) for the taxable year would be divided by 5 and multiplied by 12. The guaranteed amount would then be divided by the result of this computation to obtain the guarantee period. If the contract merely guarantees that proceeds from a unit or units of a fund shall be paid for a fixed number of years or the life (or lives) of an annuitant (or annuitants), whichever is the longer, the fixed number of years is the guarantee period. The appropriate percentage in Table III or VII shall be applied to whichever of the following is the smaller: (i) the investment in the contract; or (ii) the product of the payments received in the first taxable year, placed on an annual basis, multiplied by the number of years for which payment of the proceeds of a unit or units is guaranteed.

(2) The principles of this paragraph may be illustrated by the following examples:

Example (1). Taxpayer A, a 50-year-old male purchases for \$25,000 a contract which provides for variable monthly payments to be paid to him for his life. The contract also provides that if he should die before receiving payments for fifteen years, payments shall continue according to the original formula to his estate or beneficiary until payments have been made for that period. Beginning with the month of September, A receives payments which total \$450 for the first taxable year of receipt. This amount, placed on an annual basis, is \$1,350 (\$450 divided by 4, or \$112.50; \$112.50 multiplied by 12, or \$1,350). If there is no post-June 1986 investment in the contract, the guaranteed amount is considered to be \$20,250 (\$1,350×15), and the multiple from Table III (found in the same manner as in paragraph (b) of this section), 9 percent, applied to \$20,250 (since this amount is less than the investment in the contract), results in a refund adjustment of \$1,822.50. The latter amount, subtracted from the investment in the contract of \$25,000,

results in an adjusted investment in the contract of \$23,177.50. If A dies before receiving payments for 15 years and the remaining payments are made to B, his beneficiary, B shall exclude the entire amount of such payments from his gross income until the amounts so received by B, together with the amount received by A and excludable from A's gross income, equal or exceed \$25,000. Any excess and any payments thereafter received by B shall be fully includible in gross income.

Example (2). Assume the same facts as in example (1), except that the total investment in the contract was made after June 30, 1986. The applicable multiple found in Table VII is 3 percent. When this is applied to the guaranteed amount of \$20,250, it results in a refund adjustment of \$607.50. The adjusted investment in the contract is \$24,392.50 (\$25,000—\$607.50).

(e) *Adjustment of the investment in the contract where more than one annuity element is provided for a single consideration.* In the case of contracts to which paragraph (b) of § 1.72-6 applies for the purpose of allocating the investment in the contract to two or more annuity elements which are provided for a single consideration, if one or more of such elements involves a refund feature, the portion of the investment in the contract properly allocable to each such element shall be adjusted for the refund feature before aggregating all the investments in order to obtain the exclusion ratio which is to apply to the contract as a whole.

Example (1). If taxpayer A, an insured 70 years of age, upon maturity of an endowment policy which cost him a net amount of \$86,000, elected a dual settlement consisting of (1) monthly payments for his life aggregating \$4,146 per year with 10 years' payments certain, and (2) monthly payments for his 60-year-old brother, B, aggregating \$2,820 per year with 20 years' payments certain, the exclusion ratio to be used by both A and B if there is no post-June 1986 investment in the contract would be determined in the following manner:

A's expected return (A's payments per year of \$4,146 multiplied by his life expectancy from Table 1 of 12.1).....	\$50,166.60
B's expected return (B's payments per year of \$2,820 multiplied by his life expectancy from Table 1 of 18.2).....	\$51,324.00
Sum of expected returns to be used in determining exclusion ratio.....	\$101,490.60
Percentage of total expected return attributable to A's expectancy of life (\$50,166.60 ÷ \$101,490.60).....	49.4

Percentage of total expected return attributable to B's expectancy of life (\$51,324 ÷ \$101,490.60).....	50.6	
Portion of investment in the contract allocable to A's annuity (49.4 percent of \$86,000)...	\$42,484.00	
Portion of investment in the contract allocable to B's annuity (50.6 percent of \$86,000)...	\$43,516.00	
Value of the refund feature with respect to A's annuity (percentage from Table III for male, age 70, and duration 10, or 21 percent, multiplied by lesser of guaranteed amount and allocable portion of investment in the contract, \$41,460).....	\$8,707.00	
A's allocable portion of the investment in the contract adjusted for refund feature (\$42,484 less \$8,707.00).....	\$33,777.00	
Value of the refund feature with respect to B's annuity (percentage from Table III for male, age 60, and duration 20, or 25 percent, multiplied by lesser of guaranteed amount and allocable portion of investment in the contract, \$43,516).....	\$10,879.00	
B's allocable portion of the investment in the contract adjusted for refund feature (\$43,516 less \$10,879.00).....	\$32,637.00	
Sum of A's and B's allocable portions of the investment in the contract after adjustment for the refund feature.....	\$66,414.00	
Exclusion ratio for the contract as a whole (total adjusted investment in the contract, \$66,414, divided by the total expected return from above, \$101,490.60) (percent).....	65.4	

Example (2). Assume the same facts as in example (1) except that the total investment in the contract was made after June 30, 1986. The exclusion ratio to be used by both A and B would be 56.9 percent, determined as follows:

A's expected return (A's payments per year of \$4,146 multiplied by his life expectancy from Table V of 16.0).....	\$66,336.00	
B's expected return (B's payments per year of \$2,820 multiplied by his life expectancy from Table V of 24.2).....	\$68,244.00	
Sum of expected returns to be used in determining exclusion ratio.....	\$134,580.00	
Percentage of total expected return attributable to A's expectancy of life (\$66,336.00 ÷ \$134,580.00).....	49.3	
Percentage of total expected return attributable to B's expectancy of life (\$68,244.00 ÷ \$134,580.00).....	50.7	

Portion of investment in the contract allocable to A's annuity (49.3 percent of \$86,000)...	\$42,398.00	
Portion of investment in the contract allocable to B's annuity (50.7 percent of \$86,000)...	\$43,602.00	
Value of the refund feature with respect to A's annuity (percentage from Table VII for age 70 and duration 10, or 11 percent, multiplied by lesser of the guaranteed amount and allocable portion of investment in the contract, \$41,460).....	\$4,560.60	
A's allocable portion of the investment in the contract adjusted for refund feature (\$42,398 less \$4,560.60).....	\$37,837.40	
Value of the refund feature with respect to B's annuity (percentage from Table VII for age 60 and duration 20, or 11 percent, multiplied by lesser of guaranteed amount and allocable portion of investment in the contract, \$43,602).....	\$4,796.22	
B's allocable portion of the investment in the contract adjusted for refund feature (\$43,602 less \$4,796.22).....	\$38,805.78	
Sum of A's and B's allocable portions of the investment in the contract after adjustment for the refund feature.....	\$76,643.18	
Exclusion ratio for the contract as a whole (total adjusted investment in the contract, \$76,643.18, divided by the total expected return from above, \$134,580.00) (percent).....	56.9	

(f) *Adjustment of investment in the contract with respect to contracts subject to § 1.72-6(d).* In the case of a contract to which § 1.72-6(d) (relating to contracts in which amounts were invested both before July 1, 1986, and after June 30, 1986) applies, this section is applied in the manner prescribed in § 1.72-6(d) and, in particular, § 1.72-6(d)(5)(vi).

Par. 6. Section 1.72-9 is amended by revising the introductory text preceding the tables and the concluding text following the tables and adding new Tables V, VI, VIA, VII, and VIII to read as follows:

§ 1.72-9 Tables.

The following tables are to be used in connection with computations under section 72 and the regulations thereunder. Tables I, II, IIA, III, and IV are to be used if the investment in the contract does not include a post-June 1986 investment in the contract (as defined in § 1.72-6(d)(3)). Tables V, VI, VIA, VII, and VIII are to be used if the investment in the contract includes a post-June 1986 investment in the contract (as defined in § 1.72-6(d)(3)).

In the case of a contract under which amounts are received as an annuity after June 30, 1986, a taxpayer receiving such amounts may elect to treat the entire investment in the contract as post-June 1986 investment in the contract and thus apply Tables V through VIII. A taxpayer may make the election for any taxable year in which such amounts are received by attaching to the taxpayer's return for such taxable year a statement that the taxpayer is electing under § 1.72-9 to treat the entire investment in the contract as post-June 1986 investment in the contract. The statement must contain the taxpayer's name, address, and taxpayer identification number. The election is irrevocable and applies with respect to all amounts that the taxpayer receives as an annuity under the contract in the taxable year for which the election is made or in any subsequent taxable year. (Note that for purposes of the examples in §§ 1.72-4 through 1.72-11 the election described in this section is disregarded (i.e., it is assumed that the taxpayer does not make an election under this section).) See also § 1.72-6(d)(3) for rules treating the entire investment in a contract as post-June 1986 investment in a contract if the annuity starting date of the contract is after June 30, 1986, and the contract provides for a disqualifying form of payment or settlement, such as an option to receive a lump sum in full discharge of the obligation under the contract. In addition, see § 1.72-6(d) for special rules concerning the tables to be used and the separate computations required if the investment in the contract includes both a pre-July 1986 investment in the contract and a post-June 1986 investment in the contract and the election described in § 1.72-6(d)(6) is made with respect to the contract.

TABLE V—ORDINARY LIFE ANNUITIES ONE LIFE—EXPECTED RETURN MULTIPLES

Age	Multiple
5.....	76.6
6.....	75.6
7.....	74.7
8.....	73.7
9.....	72.7
10.....	71.7
11.....	70.7
12.....	69.7
13.....	68.8
14.....	67.8
15.....	66.8
16.....	65.8
17.....	64.8
18.....	63.9
19.....	62.9
20.....	61.9
21.....	60.9
22.....	59.9
23.....	59.0
24.....	58.0
25.....	57.0
26.....	56.0

TABLE V—ORDINARY LIFE ANNUITIES ONE LIFE—EXPECTED RETURN MULTIPLES—Continued

Age	Multiple
27	55.1
28	54.1
29	53.1
30	52.2
31	51.2
32	50.2
33	49.3
34	48.3
35	47.3
36	46.4
37	45.4
38	44.4
39	43.5
40	42.5
41	41.5
42	40.6
43	39.6
44	38.7
45	37.7
46	36.8
47	35.9
48	34.9
49	34.0
50	33.1
51	32.2
52	31.3
53	30.4
54	29.5
55	28.6
56	27.7

TABLE V—ORDINARY LIFE ANNUITIES ONE LIFE—EXPECTED RETURN MULTIPLES—Continued

Age	Multiple
57	26.8
58	25.9
59	25.0
60	24.2
61	23.3
62	22.5
63	21.6
64	20.8
65	20.0
66	19.2
67	18.4
68	17.6
69	16.8
70	16.0
71	15.3
72	14.6
73	13.9
74	13.2
75	12.5
76	11.9
77	11.2
78	10.6
79	10.0
80	9.5
81	8.9
82	8.4
83	7.9
84	7.4
85	6.9
86	6.5

TABLE V—ORDINARY LIFE ANNUITIES ONE LIFE—EXPECTED RETURN MULTIPLES—Continued

Age	Multiple
87	6.1
88	5.7
89	5.3
90	5.0
91	4.7
92	4.4
93	4.1
94	3.9
95	3.7
96	3.4
97	3.2
98	3.0
99	2.8
100	2.7
101	2.5
102	2.3
103	2.1
104	1.9
105	1.8
106	1.6
107	1.4
108	1.3
109	1.1
110	1.0
111	.9
112	.8
113	.7
114	.6
115	.5

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	5	6	7	8	9	10	11	12	13	14
5	83.8	83.3	82.8	82.4	82.0	81.6	81.2	80.9	80.6	80.3
6	83.3	82.8	82.3	81.8	81.4	81.0	80.6	80.3	79.9	79.6
7	82.8	82.3	81.8	81.3	80.9	80.4	80.0	79.6	79.3	78.9
8	82.4	81.8	81.3	80.8	80.3	79.9	79.4	79.0	78.6	78.3
9	82.0	81.4	80.9	80.3	79.8	79.3	78.9	78.4	78.0	77.6
10	81.6	81.0	80.4	79.9	79.3	78.8	78.3	77.9	77.4	77.0
11	81.2	80.6	80.0	79.4	78.9	78.3	77.8	77.3	76.9	76.4
12	80.9	80.3	79.6	79.0	78.4	77.9	77.3	76.8	76.3	75.9
13	80.6	79.9	79.3	78.6	78.0	77.4	76.9	76.3	75.8	75.3
14	80.3	79.6	78.9	78.3	77.6	77.0	76.4	75.9	75.3	74.8
15	80.0	79.3	78.6	77.9	77.3	76.6	76.0	75.4	74.9	74.3
16	79.8	79.0	78.3	77.6	76.9	76.3	75.6	75.0	74.4	73.9
17	79.5	78.8	78.0	77.3	76.6	75.9	75.3	74.6	74.0	73.4
18	79.3	78.5	77.8	77.0	76.3	75.6	74.9	74.3	73.6	73.0
19	79.1	78.3	77.5	76.8	76.0	75.3	74.6	73.9	73.3	72.6
20	78.9	78.1	77.3	76.5	75.8	75.0	74.3	73.6	72.9	72.3
21	78.7	77.9	77.1	76.3	75.5	74.8	74.0	73.3	72.6	71.9
22	78.6	77.7	76.9	76.1	75.3	74.5	73.8	73.0	72.3	71.6
23	78.4	77.6	76.7	75.9	75.1	74.3	73.5	72.8	72.0	71.3
24	78.3	77.4	76.6	75.7	74.9	74.1	73.3	72.6	71.8	71.1
25	78.2	77.3	76.4	75.6	74.8	73.9	73.1	72.3	71.6	70.8
26	78.0	77.2	76.3	75.4	74.6	73.8	72.9	72.1	71.3	70.6
27	77.9	77.1	76.2	75.3	74.4	73.6	72.8	71.9	71.1	70.3
28	77.8	76.9	76.1	75.2	74.3	73.4	72.6	71.8	70.9	70.1
29	77.7	76.8	76.0	75.1	74.2	73.3	72.5	71.6	70.8	70.0
30	77.7	76.8	75.9	75.0	74.1	73.2	72.3	71.5	70.6	69.8
31	77.6	76.7	75.8	74.9	74.0	73.1	72.2	71.3	70.5	69.6
32	77.5	76.6	75.7	74.8	73.9	73.0	72.1	71.2	70.3	69.5
33	77.5	76.5	75.6	74.7	73.8	72.9	72.0	71.1	70.2	69.3
34	77.4	76.5	75.5	74.6	73.7	72.8	71.9	71.0	70.1	69.2
35	77.3	76.4	75.5	74.5	73.6	72.7	71.8	70.9	70.0	69.1
36	77.3	76.3	75.4	74.5	73.5	72.6	71.7	70.8	69.9	69.0
37	77.2	76.3	75.4	74.4	73.5	72.6	71.6	70.7	69.8	68.9
38	77.2	76.2	75.3	74.4	73.4	72.5	71.6	70.6	69.7	68.8
39	77.2	76.2	75.3	74.3	73.4	72.4	71.5	70.6	69.6	68.7
40	77.1	76.2	75.2	74.3	73.3	72.4	71.4	70.5	69.6	68.6
41	77.1	76.1	75.2	74.2	73.2	72.3	71.3	70.4	69.5	68.6
42	77.0	76.1	75.1	74.1	73.2	72.2	71.3	70.3	69.4	68.5
43	77.0	76.0	75.1	74.1	73.1	72.2	71.2	70.3	69.3	68.4
44	77.0	76.0	75.0	74.0	73.1	72.1	71.2	70.2	69.3	68.3
45	76.9	76.0	75.0	74.0	73.0	72.1	71.1	70.1	69.2	68.2
46	76.9	75.9	74.9	73.9	73.0	72.0	71.0	70.1	69.1	68.2
47	76.9	75.9	74.9	73.9	72.9	72.0	71.0	70.0	69.1	68.1
48	76.8	75.8	74.8	73.8	72.8	71.9	71.0	70.0	69.0	68.1
49	76.8	75.8	74.8	73.8	72.8	71.9	70.9	70.0	69.0	68.0
50	76.8	75.8	74.8	73.8	72.8	71.9	70.9	69.9	69.0	68.0
51	76.8	75.8	74.8	73.8	72.8	71.9	70.9	69.9	69.0	68.0
52	76.8	75.8	74.8	73.8	72.8	71.9	70.9	69.9	69.0	68.0
53	76.8	75.8	74.8	73.8	72.8	71.9	70.9	69.9	69.0	68.0
54	76.8	75.8	74.8	73.8	72.8	71.9	70.9	69.9	69.0	68.0
55	76.8	75.8	74.8	73.8	72.8	71.9	70.9	69.9	69.0	68.0
56	76.8	75.8	74.8	73.8	72.8	71.9	70.9	69.9	69.0	68.0

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	5	6	7	8	9	10	11	12	13	14
57	76.8	75.8	74.8	73.8	72.9	71.9	70.9	69.9	69.0	68.0
58	76.8	75.8	74.8	73.8	72.8	71.9	70.9	69.9	68.9	68.0
59	76.7	75.8	74.8	73.8	72.8	71.8	70.9	69.9	68.9	67.9
60	76.7	75.8	74.8	73.8	72.8	71.8	70.9	69.9	68.9	67.9
61	76.7	75.7	74.8	73.8	72.8	71.8	70.8	69.9	68.9	67.9
62	76.7	75.7	74.8	73.8	72.8	71.8	70.8	69.9	68.9	67.9
63	76.7	75.7	74.8	73.8	72.8	71.8	70.8	69.8	68.9	67.9
64	76.7	75.7	74.7	73.8	72.8	71.8	70.8	69.8	68.9	67.9
65	76.7	75.7	74.7	73.8	72.8	71.8	70.8	69.8	68.9	67.9
66	76.7	75.7	74.7	73.7	72.8	71.8	70.8	69.8	68.8	67.9
67	76.7	75.7	74.7	73.7	72.8	71.8	70.8	69.8	68.8	67.9
68	76.7	75.7	74.7	73.7	72.7	71.8	70.8	69.8	68.8	67.8
69	76.7	75.7	74.7	73.7	72.7	71.8	70.8	69.8	68.8	67.8
70	76.7	75.7	74.7	73.7	72.7	71.8	70.8	69.8	68.8	67.8
71	76.7	75.7	74.7	73.7	72.7	71.8	70.8	69.8	68.8	67.8
72	76.7	75.7	74.7	73.7	72.7	71.8	70.8	69.8	68.8	67.8
73	76.7	75.7	74.7	73.7	72.7	71.7	70.8	69.8	68.8	67.8
74	76.7	75.7	74.7	73.7	72.7	71.7	70.8	69.8	68.8	67.8
75	76.7	75.7	74.7	73.7	72.7	71.7	70.8	69.8	68.8	67.8
76	76.6	75.7	74.7	73.7	72.7	71.7	70.8	69.8	68.8	67.8
77	76.6	75.7	74.7	73.7	72.7	71.7	70.8	69.8	68.8	67.8
78	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
79	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
80	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
81	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
82	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
83	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
84	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
85	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
86	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
87	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
88	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.8	68.8	67.8
89	76.6	75.7	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
90	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
91	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
92	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
93	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
94	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
95	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
96	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
97	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
98	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
99	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
100	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
101	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
102	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
103	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
104	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
105	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
106	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
107	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
108	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
109	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
110	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
111	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
112	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
113	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
114	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8
115	76.6	75.6	74.7	73.7	72.7	71.7	70.7	69.7	68.8	67.8

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	15	16	17	18	19	20	21	22	23	24
15	73.8	73.3	72.9	72.4	72.0	71.6	71.3	70.9	70.6	70.3
16	73.3	72.8	72.3	71.9	71.4	71.0	70.7	70.3	70.0	69.6
17	72.9	72.3	71.8	71.3	70.9	70.5	70.0	69.7	69.3	69.0
18	72.4	71.9	71.3	70.8	70.4	69.0	69.5	69.9	69.3	68.3
19	72.0	71.4	70.9	70.4	69.8	69.4	68.9	68.5	68.1	67.7
20	71.6	71.0	70.5	69.9	69.4	68.8	68.4	67.9	67.5	67.1
21	71.3	70.7	70.0	69.5	68.9	68.4	67.9	67.4	66.9	66.5
22	70.9	70.3	69.7	69.0	68.5	67.9	67.4	66.9	66.4	65.9
23	70.6	70.0	69.3	68.7	68.1	67.5	66.9	66.4	65.9	65.4
24	70.3	69.6	69.0	68.3	67.7	67.1	66.5	65.9	65.4	64.9
25	70.1	69.3	68.6	68.0	67.3	66.7	66.1	65.5	64.9	64.4
26	69.8	69.1	68.3	67.6	67.0	66.3	65.7	65.1	64.5	63.9
27	69.6	68.8	68.1	67.3	66.7	66.0	65.3	64.7	64.1	63.5
28	69.3	68.6	67.8	67.1	66.4	65.7	65.0	64.3	63.7	63.1
29	69.1	68.4	67.6	66.8	66.1	65.4	64.7	64.0	63.3	62.7
30	69.0	68.2	67.4	66.6	65.8	65.1	64.4	63.7	63.0	62.3
31	68.8	68.0	67.2	66.4	65.6	64.8	64.1	63.4	62.7	62.0
32	68.6	67.8	67.0	66.2	65.4	64.6	63.8	63.1	62.4	61.7
33	68.5	67.6	66.8	66.0	65.2	64.4	63.6	62.8	62.1	61.4
34	68.3	67.5	66.6	65.8	65.0	64.2	63.4	62.6	61.9	61.1
35	68.2	67.4	66.5	65.6	64.8	64.0	63.2	62.4	61.6	60.9
36	68.1	67.2	66.4	65.5	64.7	63.8	63.0	62.2	61.4	60.6
37	68.0	67.1	66.2	65.4	64.5	63.7	62.8	62.0	61.2	60.4
38	67.9	67.0	66.1	65.2	64.4	63.5	62.7	61.8	61.0	60.2
39	67.8	66.9	66.0	65.1	64.2	63.4	62.5	61.7	60.8	60.0
40	67.7	66.8	65.9	65.0	64.1	63.3	62.4	61.5	60.7	59.9

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	15	16	17	18	19	20	21	22	23	24
41	67.7	66.7	65.8	64.9	64.0	63.1	62.3	61.4	60.5	59.7
42	67.6	66.7	65.7	64.8	63.9	63.0	62.2	61.3	60.4	59.6
43	67.5	66.6	65.7	64.8	63.8	62.9	62.1	61.2	60.3	59.4
44	67.5	66.5	65.6	64.7	63.8	62.9	62.0	61.1	60.2	59.3
45	67.4	66.5	65.5	64.6	63.7	62.8	61.9	61.0	60.1	59.2
46	67.4	66.4	65.4	64.5	63.6	62.7	61.8	60.9	60.0	59.1
47	67.3	66.4	65.4	64.5	63.6	62.6	61.7	60.8	59.9	59.0
48	67.3	66.3	65.4	64.4	63.5	62.6	61.6	60.7	59.8	58.9
49	67.2	66.3	65.3	64.4	63.5	62.5	61.6	60.7	59.7	58.8
50	67.2	66.2	65.3	64.3	63.4	62.5	61.5	60.6	59.7	58.8
51	67.2	66.2	65.3	64.3	63.4	62.4	61.5	60.5	59.6	58.7
52	67.1	66.2	65.2	64.3	63.3	62.4	61.4	60.5	59.6	58.6
53	67.1	66.2	65.2	64.2	63.3	62.3	61.4	60.4	59.5	58.6
54	67.1	66.1	65.2	64.2	63.2	62.3	61.3	60.4	59.5	58.5
55	67.1	66.1	65.1	64.2	63.2	62.2	61.3	60.3	59.4	58.4
56	67.0	66.1	65.1	64.1	63.2	62.2	61.2	60.3	59.3	58.4
57	67.0	66.0	65.1	64.1	63.1	62.2	61.2	60.2	59.3	58.3
58	67.0	66.0	65.0	64.1	63.1	62.1	61.2	60.2	59.2	58.3
59	66.9	66.0	65.0	64.0	63.1	62.1	61.1	60.2	59.2	58.3
60	66.9	66.0	65.0	64.0	63.0	62.1	61.1	60.2	59.2	58.2
61	66.9	65.9	65.0	64.0	63.0	62.1	61.1	60.1	59.2	58.2
62	66.9	65.9	65.0	64.0	63.0	62.0	61.1	60.1	59.1	58.2
63	66.9	65.9	64.9	64.0	63.0	62.0	61.1	60.1	59.1	58.2
64	66.9	65.9	64.9	64.0	63.0	62.0	61.1	60.1	59.1	58.2
65	66.9	65.9	64.9	64.0	63.0	62.0	61.1	60.1	59.1	58.1
66	66.9	65.9	64.9	63.9	63.0	62.0	61.0	60.1	59.1	58.1
67	66.9	65.9	64.9	63.9	63.0	62.0	61.0	60.0	59.1	58.1
68	66.9	65.9	64.9	63.9	63.0	62.0	61.0	60.0	59.0	58.1
69	66.9	65.9	64.9	63.9	63.0	62.0	61.0	60.0	59.0	58.1
70	66.9	65.9	64.9	63.9	63.0	62.0	61.0	60.0	59.0	58.1
71	66.9	65.9	64.9	63.9	63.0	62.0	61.0	60.0	59.0	58.1
72	66.9	65.9	64.9	63.9	62.9	62.0	61.0	60.0	59.1	58.1
73	66.8	65.9	64.9	63.9	62.9	62.0	61.0	60.0	59.0	58.1
74	66.8	65.9	64.9	63.9	62.9	62.0	61.0	60.0	59.0	58.1
75	66.8	65.9	64.9	63.9	62.9	62.0	61.0	60.0	59.0	58.1
76	66.8	65.9	64.9	63.9	62.9	61.9	61.0	60.0	59.0	58.1
77	66.8	65.9	64.9	63.9	62.9	61.9	61.0	60.0	59.0	58.0
78	66.8	65.8	64.9	63.9	62.9	61.9	61.0	60.0	59.0	58.0
79	66.8	65.8	64.9	63.9	62.9	61.9	61.0	60.0	59.0	58.0
80	66.8	65.8	64.9	63.9	62.9	61.9	61.0	60.0	59.0	58.0
81	66.8	65.8	64.9	63.9	62.9	61.9	60.9	60.0	59.0	58.0
82	66.8	65.8	64.9	63.9	62.9	61.9	60.9	60.0	59.0	58.0
83	66.8	65.8	64.9	63.9	62.9	61.9	60.9	60.0	59.0	58.0
84	66.8	65.8	64.8	63.9	62.9	61.9	60.9	60.0	59.0	58.0
85	66.8	65.8	64.8	63.9	62.9	61.9	60.9	60.0	59.0	58.0
86	66.8	65.8	64.8	63.9	62.9	61.9	60.9	60.0	59.0	58.0
87	66.8	65.8	64.8	63.9	62.9	61.9	60.9	60.0	59.0	58.0
88	66.8	65.8	64.8	63.9	62.9	61.9	60.9	60.0	59.0	58.0
89	66.8	65.8	64.8	63.9	62.9	61.9	60.9	60.0	59.0	58.0
90	66.8	65.8	64.8	63.9	62.9	61.9	60.9	60.0	59.0	58.0
91	66.8	65.8	64.8	63.9	62.9	61.9	60.9	60.0	59.0	58.0
92	66.8	65.8	64.8	63.9	62.9	61.9	60.9	60.0	59.0	58.0
93	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
94	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
95	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
96	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
97	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
98	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
99	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
100	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
101	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
102	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
103	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
104	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
105	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
106	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
107	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
108	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
109	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
110	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
111	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
112	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
113	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
114	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0
115	66.8	65.8	64.8	63.9	62.9	61.9	60.9	59.9	59.0	58.0

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	25	26	27	28	29	30	31	32	33	34
25	63.9	63.4	62.9	62.5	62.1	61.7	61.3	61.0	60.7	60.4
26	63.4	62.9	62.4	61.9	61.5	61.1	60.7	60.4	60.0	59.7
27	62.9	62.4	61.9	61.4	60.9	60.5	60.1	59.7	59.4	59.0
28	62.5	61.9	61.4	60.9	60.4	60.0	59.5	59.1	58.7	58.4
29	62.1	61.5	60.9	60.4	59.9	59.4	59.0	58.5	58.1	57.7
30	61.7	61.1	60.5	60.0	59.4	58.9	58.4	58.0	57.5	57.1
31	61.3	60.7	60.1	59.5	59.0	58.4	57.9	57.4	57.0	56.5
32	61.0	60.4	59.7	59.1	58.5	58.0	57.4	56.9	56.4	56.0
33	60.7	60.0	59.4	58.7	58.1	57.5	57.0	56.4	55.9	55.5

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	25	26	27	28	29	30	31	32	33	34
34	60.4	59.7	59.0	58.4	57.7	57.1	56.5	56.0	55.5	54.9
35	60.1	59.4	58.7	58.0	57.4	56.7	56.1	55.6	55.0	54.5
36	59.9	59.1	58.4	57.7	57.0	56.4	55.8	55.1	54.6	54.0
37	59.6	58.9	58.1	57.4	56.7	56.0	55.4	54.8	54.2	53.6
38	59.4	58.6	57.9	57.2	56.5	55.7	55.1	54.4	53.8	53.2
39	59.2	58.4	57.7	56.9	56.2	55.4	54.7	54.1	53.4	52.8
40	59.0	58.2	57.4	56.7	55.9	55.2	54.5	53.8	53.1	52.4
41	58.9	58.0	57.2	56.4	55.7	54.9	54.2	53.5	52.8	52.1
42	58.7	57.9	57.1	56.2	55.5	54.7	53.9	53.2	52.5	51.8
43	58.6	57.7	56.9	56.1	55.3	54.5	53.7	52.9	52.2	51.5
44	58.4	57.6	56.7	55.9	55.1	54.3	53.5	52.7	52.0	51.2
45	58.3	57.4	56.6	55.7	54.9	54.1	53.3	52.5	51.7	51.0
46	58.2	57.3	56.5	55.6	54.8	53.9	53.1	52.3	51.5	50.7
47	58.1	57.2	56.3	55.5	54.6	53.8	52.9	52.1	51.3	50.5
48	58.0	57.1	56.2	55.3	54.5	53.6	52.8	51.9	51.1	50.3
49	57.9	57.0	56.1	55.2	54.4	53.5	52.6	51.8	51.0	50.1
50	57.8	56.9	56.0	55.1	54.2	53.4	52.5	51.7	50.8	50.0
51	57.8	56.9	55.9	55.0	54.1	53.3	52.4	51.5	50.7	49.8
52	57.7	56.8	55.9	55.0	54.1	53.2	52.3	51.4	50.5	49.7
53	57.6	56.7	55.8	54.9	54.0	53.1	52.2	51.3	50.4	49.6
54	57.6	56.7	55.7	54.8	53.9	53.0	52.1	51.2	50.3	49.4
55	57.5	56.6	55.7	54.7	53.8	52.9	52.0	51.1	50.2	49.3
56	57.5	56.5	55.6	54.7	53.8	52.8	51.9	51.0	50.1	49.2
57	57.4	56.5	55.6	54.6	53.7	52.8	51.9	50.9	50.0	49.1
58	57.4	56.5	55.5	54.6	53.6	52.7	51.8	50.9	50.0	49.1
59	57.4	56.4	55.5	54.5	53.6	52.7	51.7	50.8	49.9	49.0
60	57.3	56.4	55.4	54.5	53.6	52.6	51.7	50.8	49.8	48.9
61	57.3	56.4	55.4	54.5	53.5	52.6	51.6	50.7	49.8	48.9
62	57.3	56.3	55.4	54.4	53.5	52.5	51.6	50.7	49.7	48.8
63	57.3	56.3	55.3	54.4	53.4	52.5	51.5	50.6	49.6	48.7
64	57.2	56.3	55.3	54.4	53.4	52.4	51.5	50.5	49.6	48.7
65	57.2	56.3	55.3	54.3	53.4	52.4	51.5	50.5	49.6	48.6
66	57.2	56.2	55.3	54.3	53.4	52.4	51.4	50.4	49.5	48.6
67	57.2	56.2	55.3	54.3	53.3	52.4	51.4	50.4	49.5	48.5
68	57.2	56.2	55.2	54.3	53.3	52.3	51.4	50.4	49.4	48.5
69	57.1	56.2	55.2	54.2	53.3	52.3	51.4	50.4	49.4	48.5
70	57.1	56.2	55.2	54.2	53.3	52.3	51.3	50.4	49.4	48.5
71	57.1	56.1	55.2	54.2	53.2	52.3	51.3	50.4	49.4	48.4
72	57.1	56.1	55.2	54.2	53.2	52.3	51.3	50.3	49.4	48.4
73	57.1	56.1	55.2	54.2	53.2	52.2	51.3	50.3	49.4	48.4
74	57.1	56.1	55.1	54.2	53.2	52.2	51.3	50.3	49.3	48.4
75	57.1	56.1	55.1	54.2	53.2	52.2	51.3	50.3	49.3	48.4
76	57.1	56.1	55.1	54.2	53.2	52.2	51.3	50.3	49.3	48.4
77	57.1	56.1	55.1	54.2	53.2	52.2	51.3	50.3	49.3	48.4
78	57.1	56.1	55.1	54.2	53.2	52.2	51.3	50.3	49.3	48.4
79	57.1	56.1	55.1	54.1	53.2	52.2	51.2	50.3	49.3	48.3
80	57.1	56.1	55.1	54.1	53.2	52.2	51.2	50.3	49.3	48.3
81	57.0	56.1	55.1	54.1	53.2	52.2	51.2	50.3	49.3	48.3
82	57.0	56.1	55.1	54.1	53.2	52.2	51.2	50.3	49.3	48.3
83	57.0	56.1	55.1	54.1	53.2	52.2	51.2	50.3	49.3	48.3
84	57.0	56.1	55.1	54.1	53.2	52.2	51.2	50.2	49.3	48.3
85	57.0	56.1	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
86	57.0	56.1	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
87	57.0	56.1	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
88	57.0	56.1	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
89	57.0	56.1	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
90	57.0	56.1	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
91	57.0	56.1	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
92	57.0	56.1	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
93	57.0	56.1	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
94	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
95	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
96	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
97	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
98	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
99	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
100	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
101	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
102	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
103	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
104	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
105	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
106	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
107	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
108	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
109	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
110	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
111	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
112	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
113	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
114	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3
115	57.0	56.0	55.1	54.1	53.1	52.2	51.2	50.2	49.3	48.3

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	35	36	37	38	39	40	41	42	43	44
35	54.0	53.5	53.0	52.6	52.2	51.8	51.4	51.1	50.8	50.5
36	53.5	53.0	52.5	52.0	51.6	51.2	50.8	50.4	50.1	49.8
37	53.0	52.5	52.0	51.5	51.0	50.6	50.2	49.8	49.5	49.1

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	35	36	37	38	39	40	41	42	43	44
38	52.6	52.0	51.5	51.0	50.5	50.0	49.6	49.2	48.8	48.5
39	52.2	51.6	51.0	50.5	50.0	49.5	49.1	48.6	48.2	47.8
40	51.8	51.2	50.6	50.0	49.5	49.0	48.5	48.1	47.6	47.2
41	51.4	50.8	50.2	49.6	49.1	48.5	48.0	47.5	47.1	46.7
42	51.1	50.4	49.8	49.2	48.6	48.1	47.5	47.0	46.6	46.1
43	50.8	50.1	49.5	48.8	48.2	47.6	47.1	46.6	46.0	45.6
44	50.5	49.8	49.1	48.5	47.8	47.2	46.7	46.3	45.7	45.1
45	50.2	49.5	48.8	48.1	47.5	46.9	46.3	45.7	45.1	44.6
46	50.0	49.2	48.5	47.8	47.2	46.5	45.9	45.3	44.7	44.1
47	49.7	49.0	48.3	47.5	46.8	46.2	45.5	44.9	44.3	43.7
48	49.5	48.8	48.0	47.3	46.6	45.9	45.2	44.5	43.9	43.3
49	49.3	48.5	47.8	47.0	46.3	45.6	44.9	44.2	43.6	42.9
50	49.2	48.4	47.6	46.8	46.0	45.3	44.6	43.9	43.2	42.6
51	49.0	48.2	47.4	46.6	45.8	45.1	44.3	43.6	42.9	42.2
52	48.8	48.0	47.2	46.4	45.6	44.8	44.1	43.3	42.6	41.9
53	48.7	47.9	47.0	46.2	45.4	44.6	43.9	43.1	42.4	41.7
54	48.6	47.7	46.9	46.0	45.2	44.4	43.6	42.9	42.1	41.4
55	48.5	47.6	46.7	45.9	45.1	44.2	43.4	42.7	41.9	41.2
56	48.3	47.5	46.6	45.8	44.9	44.1	43.3	42.5	41.7	40.9
57	48.3	47.4	46.5	45.6	44.8	43.9	43.1	42.3	41.5	40.7
58	48.2	47.3	46.4	45.5	44.7	43.8	43.0	42.1	41.3	40.5
59	48.1	47.2	46.3	45.4	44.5	43.7	42.8	42.0	41.2	40.4
60	48.0	47.1	46.2	45.3	44.4	43.6	42.7	41.9	41.0	40.2
61	47.9	47.0	46.1	45.2	44.3	43.5	42.6	41.7	40.9	40.0
62	47.9	47.0	46.0	45.1	44.2	43.4	42.5	41.6	40.8	39.9
63	47.8	46.9	46.0	45.1	44.2	43.3	42.4	41.5	40.6	39.8
64	47.8	46.8	45.9	45.0	44.1	43.2	42.3	41.4	40.5	39.7
65	47.7	46.8	45.9	44.9	44.0	43.1	42.2	41.3	40.4	39.6
66	47.7	46.7	45.8	44.8	43.9	43.0	42.1	41.2	40.3	39.5
67	47.6	46.7	45.8	44.8	43.9	42.9	42.0	41.1	40.2	39.4
68	47.6	46.7	45.7	44.8	43.8	42.9	42.0	41.1	40.2	39.3
69	47.6	46.6	45.7	44.8	43.8	42.9	41.9	41.0	40.1	39.2
70	47.5	46.6	45.7	44.7	43.8	42.8	41.9	41.0	40.1	39.1
71	47.5	46.6	45.6	44.7	43.7	42.8	41.8	40.9	40.0	39.1
72	47.5	46.6	45.6	44.6	43.7	42.7	41.8	40.9	40.0	39.0
73	47.5	46.5	45.6	44.6	43.7	42.7	41.8	40.9	39.9	39.0
74	47.4	46.5	45.5	44.6	43.6	42.7	41.8	40.8	39.9	39.0
75	47.4	46.5	45.5	44.6	43.6	42.7	41.7	40.8	39.9	38.9
76	47.4	46.5	45.5	44.6	43.6	42.7	41.7	40.8	39.8	38.9
77	47.4	46.5	45.5	44.5	43.6	42.6	41.7	40.7	39.8	38.9
78	47.4	46.4	45.5	44.5	43.6	42.6	41.7	40.7	39.8	38.9
79	47.4	46.4	45.5	44.5	43.6	42.6	41.7	40.7	39.8	38.9
80	47.4	46.4	45.5	44.5	43.6	42.6	41.7	40.7	39.8	38.9
81	47.4	46.4	45.5	44.5	43.6	42.6	41.7	40.7	39.8	38.8
82	47.4	46.4	45.4	44.5	43.5	42.6	41.6	40.7	39.8	38.8
83	47.4	46.4	45.4	44.5	43.5	42.6	41.6	40.7	39.7	38.8
84	47.4	46.4	45.4	44.5	43.5	42.6	41.6	40.7	39.7	38.8
85	47.4	46.4	45.4	44.5	43.5	42.6	41.6	40.7	39.7	38.8
86	47.3	46.4	45.4	44.5	43.5	42.6	41.6	40.7	39.7	38.8
87	47.3	46.4	45.4	44.5	43.5	42.5	41.6	40.6	39.7	38.8
88	47.3	46.4	45.4	44.5	43.5	42.5	41.6	40.6	39.7	38.7
89	47.3	46.4	45.4	44.5	43.5	42.5	41.6	40.6	39.7	38.7
90	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.7	38.7
91	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.7	38.7
92	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.7	38.7
93	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.7	38.7
94	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.7	38.7
95	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.7	38.7
96	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.7	38.7
97	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.7	38.7
98	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.6	38.7
99	47.3	46.4	45.4	44.4	43.5	42.5	41.6	40.6	39.6	38.7
100	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
101	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
102	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
103	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
104	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
105	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
106	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
107	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
108	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
109	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
110	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
111	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
112	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
113	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
114	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
114	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7
115	47.3	46.4	45.4	44.4	43.5	42.5	41.5	40.6	39.6	38.7

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	45	46	47	48	49	50	51	52	53	54
45	44.1	43.6	43.2	42.7	42.3	42.0	41.6	41.3	41.0	40.7
46	43.6	43.1	42.6	42.2	41.8	41.4	41.0	40.6	40.3	40.0
47	43.2	42.6	42.1	41.7	41.2	40.8	40.4	40.0	39.7	39.3
48	42.7	42.2	41.7	41.2	40.7	40.2	39.8	39.4	39.0	38.7
49	42.3	41.8	41.2	40.7	40.2	39.7	39.3	38.8	38.4	38.1
50	42.0	41.4	40.8	40.2	39.7	39.2	38.7	38.3	37.9	37.5

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	45	46	47	48	49	50	51	52	53	54
51	41.6	41.0	40.4	39.8	39.3	38.7	38.2	37.8	37.3	36.9
52	41.3	40.6	40.0	39.4	38.8	38.3	37.8	37.3	36.8	36.4
53	41.0	40.3	39.7	39.0	38.4	37.9	37.3	36.8	36.3	35.8
54	40.7	40.0	39.3	38.7	38.1	37.5	36.9	36.4	35.8	35.3
55	40.4	39.7	39.0	38.4	37.7	37.1	36.5	35.9	35.4	34.9
56	40.2	39.5	38.7	38.1	37.4	36.8	36.1	35.6	35.0	34.4
57	40.0	39.2	38.5	37.8	37.1	36.4	35.8	35.2	34.6	34.0
58	39.7	39.0	38.2	37.5	36.8	36.1	35.5	34.8	34.2	33.6
59	39.6	38.8	38.0	37.3	36.6	35.9	35.2	34.5	33.9	33.3
60	39.4	38.6	37.8	37.1	36.3	35.6	34.9	34.2	33.6	32.9
61	39.2	38.4	37.6	36.9	36.1	35.4	34.6	33.9	33.3	32.6
62	39.1	38.3	37.5	36.7	35.9	35.1	34.4	33.7	33.0	32.3
63	38.9	38.1	37.3	36.5	35.7	34.9	34.2	33.5	32.7	32.0
64	38.8	38.0	37.2	36.3	35.5	34.8	34.0	33.2	32.5	31.8
65	38.7	37.9	37.0	36.2	35.4	34.6	33.8	33.0	32.3	31.6
66	38.6	37.8	36.9	36.1	35.2	34.4	33.6	32.9	32.1	31.4
67	38.5	37.7	36.8	36.0	35.1	34.3	33.5	32.7	31.9	31.2
68	38.4	37.6	36.7	35.8	35.0	34.2	33.4	32.5	31.8	31.0
69	38.4	37.5	36.6	35.7	34.9	34.1	33.2	32.4	31.6	30.8
70	38.3	37.4	36.5	35.7	34.8	34.0	33.1	32.3	31.5	30.7
71	38.2	37.3	36.5	35.6	34.7	33.9	33.0	32.2	31.4	30.5
72	38.2	37.3	36.4	35.5	34.6	33.8	32.9	32.1	31.2	30.4
73	38.1	37.2	36.3	35.4	34.6	33.7	32.8	32.0	31.1	30.3
74	38.1	37.2	36.3	35.4	34.5	33.6	32.8	31.9	31.1	30.2
75	38.1	37.1	36.2	35.3	34.5	33.6	32.7	31.8	31.0	30.1
76	38.0	37.1	36.2	35.3	34.4	33.5	32.6	31.7	30.9	30.1
77	38.0	37.1	36.2	35.3	34.4	33.5	32.6	31.7	30.8	30.0
78	38.0	37.0	36.1	35.2	34.3	33.4	32.5	31.6	30.7	29.9
79	37.9	37.0	36.1	35.2	34.3	33.4	32.5	31.6	30.7	29.8
80	37.9	37.0	36.1	35.2	34.2	33.4	32.5	31.6	30.7	29.8
81	37.9	37.0	36.0	35.1	34.2	33.3	32.4	31.5	30.6	29.7
82	37.9	36.9	36.0	35.1	34.2	33.3	32.4	31.5	30.6	29.7
83	37.9	36.9	36.0	35.1	34.2	33.3	32.4	31.5	30.6	29.7
84	37.8	36.9	36.0	35.0	34.1	33.2	32.3	31.4	30.5	29.6
85	37.8	36.9	36.0	35.1	34.1	33.2	32.3	31.4	30.5	29.6
86	37.8	36.9	36.0	35.0	34.1	33.2	32.3	31.4	30.5	29.6
87	37.8	36.9	35.9	35.0	34.1	33.2	32.3	31.4	30.5	29.6
88	37.8	36.9	35.9	35.0	34.1	33.2	32.3	31.4	30.5	29.6
89	37.8	36.9	35.9	35.0	34.1	33.2	32.3	31.4	30.5	29.6
90	37.8	36.9	35.9	35.0	34.1	33.2	32.3	31.3	30.5	29.6
91	37.8	36.8	35.9	35.0	34.1	33.2	32.2	31.3	30.4	29.5
92	37.8	36.8	35.9	35.0	34.1	33.2	32.2	31.3	30.4	29.5
93	37.8	36.8	35.9	35.0	34.1	33.1	32.2	31.3	30.4	29.5
94	37.8	36.8	35.9	35.0	34.1	33.1	32.2	31.3	30.4	29.5
95	37.8	36.8	35.9	35.0	34.0	33.1	32.2	31.3	30.4	29.5
96	37.8	36.8	35.9	35.0	34.0	33.1	32.2	31.3	30.4	29.5
97	37.8	36.8	35.9	35.0	34.0	33.1	32.2	31.3	30.4	29.5
98	37.8	36.8	35.9	35.0	34.0	33.1	32.2	31.3	30.4	29.5
99	37.8	36.8	35.9	35.0	34.0	33.1	32.2	31.3	30.4	29.5
101	37.8	36.8	35.9	35.0	34.0	33.1	32.2	31.3	30.4	29.5
102	37.8	36.8	35.9	35.0	34.0	33.1	32.2	31.3	30.4	29.5
103	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
104	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
105	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
106	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
107	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
108	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
109	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
110	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
111	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
112	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
113	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
114	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5
115	37.7	36.8	35.9	34.9	34.0	33.1	32.2	31.3	30.4	29.5

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	55	56	57	58	59	60	61	62	63	64
55	34.4	33.9	33.5	33.1	32.7	32.3	32.0	31.7	31.4	31.1
56	33.9	33.4	33.0	32.5	32.1	31.7	31.4	31.0	30.7	30.4
57	33.5	33.0	32.5	32.0	31.6	31.2	30.8	30.4	30.1	29.8
58	33.1	32.5	32.0	31.5	31.1	30.6	30.2	29.9	29.5	29.2
59	32.7	32.1	31.6	31.1	30.6	30.1	29.7	29.3	28.9	28.6
60	32.3	31.7	31.2	30.6	30.1	29.7	29.2	28.8	28.4	28.0
61	32.0	31.4	30.8	30.2	29.7	29.2	28.7	28.3	27.8	27.4
62	31.7	31.0	30.4	29.9	29.3	28.8	28.3	27.8	27.3	26.9
63	31.4	30.7	30.1	29.5	28.9	28.4	27.8	27.3	26.9	26.4
64	31.1	30.4	29.8	29.2	28.6	28.0	27.4	26.9	26.4	25.9
65	30.9	30.2	29.5	28.9	28.2	27.6	27.1	26.5	26.0	25.5
66	30.6	29.9	29.2	28.6	27.9	27.3	26.7	26.1	25.6	25.1
67	30.4	29.7	29.0	28.3	27.6	27.0	26.4	25.8	25.2	24.7
68	30.2	29.5	28.8	28.1	27.4	26.7	26.1	25.5	24.9	24.3
69	30.1	29.3	28.6	27.8	27.1	26.5	25.8	25.2	24.6	24.0
70	29.9	29.1	28.4	27.6	26.9	26.2	25.6	24.9	24.3	23.7
71	29.7	29.0	28.2	27.5	26.7	26.0	25.3	24.7	24.0	23.4
72	29.6	28.8	28.1	27.3	26.5	25.8	25.1	24.4	23.8	23.1
73	29.5	28.7	27.9	27.1	26.4	25.6	24.9	24.2	23.5	22.9
74	29.4	28.6	27.8	27.0	26.2	25.5	24.7	24.0	23.3	22.7
75	29.3	28.5	27.7	26.9	26.1	25.3	24.6	23.8	23.1	22.4

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	55	56	57	58	59	60	61	62	63	64
76	29.2	28.4	27.6	26.8	26.0	25.2	24.4	23.7	23.0	22.3
77	29.1	28.3	27.5	26.7	25.9	25.1	24.3	23.6	22.8	22.1
78	29.1	28.2	27.4	26.6	25.8	25.0	24.2	23.4	22.7	21.9
79	29.0	28.2	27.3	26.5	25.7	24.9	24.1	23.3	22.6	21.8
80	29.0	28.1	27.3	26.4	25.6	24.8	24.0	23.2	22.4	21.7
81	28.9	28.1	27.2	26.4	25.5	24.7	23.9	23.1	22.3	21.6
82	28.9	28.0	27.2	26.3	25.5	24.6	23.8	23.0	22.3	21.5
83	28.8	28.0	27.1	26.3	25.4	24.6	23.8	23.0	22.2	21.4
84	28.8	27.9	27.1	26.2	25.4	24.5	23.7	22.9	22.1	21.3
85	28.8	27.9	27.0	26.2	25.3	24.5	23.7	22.8	22.0	21.3
86	28.7	27.9	27.0	26.1	25.3	24.5	23.6	22.8	22.0	21.2
87	28.7	27.8	27.0	26.1	25.3	24.4	23.6	22.8	21.9	21.1
88	28.7	27.8	27.0	26.1	25.2	24.4	23.5	22.7	21.9	21.1
89	28.7	27.8	26.9	26.1	25.2	24.4	23.5	22.7	21.9	21.1
90	28.7	27.8	26.9	26.1	25.2	24.3	23.5	22.7	21.8	21.0
91	28.7	27.8	26.9	26.0	25.2	24.3	23.5	22.6	21.8	21.0
92	28.6	27.8	26.9	26.0	25.2	24.3	23.5	22.6	21.8	21.0
93	28.6	27.8	26.9	26.0	25.1	24.3	23.4	22.6	21.8	21.0
94	28.6	27.7	26.9	26.0	25.1	24.3	23.4	22.6	21.7	20.9
95	28.6	27.7	26.9	26.0	25.1	24.3	23.4	22.6	21.7	20.9
96	28.6	27.7	26.9	26.0	25.1	24.3	23.4	22.6	21.7	20.9
97	28.6	27.7	26.8	26.0	25.1	24.2	23.4	22.5	21.7	20.9
98	28.6	27.7	26.8	26.0	25.1	24.2	23.4	22.5	21.7	20.9
99	28.6	27.7	26.8	26.0	25.1	24.2	23.4	22.5	21.7	20.9
100	28.6	27.7	26.8	26.0	25.1	24.2	23.4	22.5	21.7	20.9
101	28.6	27.7	26.8	25.9	25.1	24.2	23.4	22.5	21.7	20.8
102	28.6	27.7	26.8	25.9	25.1	24.2	23.4	22.5	21.7	20.8
103	28.6	27.7	26.8	25.9	25.1	24.2	23.3	22.5	21.7	20.8
104	28.6	27.7	26.8	25.9	25.1	24.2	23.3	22.5	21.7	20.8
105	28.6	27.7	26.8	25.9	25.1	24.2	23.3	22.5	21.6	20.8
106	28.6	27.7	26.8	25.9	25.1	24.2	23.3	22.5	21.6	20.8
107	28.6	27.7	26.8	25.9	25.1	24.2	23.3	22.5	21.6	20.8
108	28.6	27.7	26.8	25.9	25.1	24.2	23.3	22.5	21.6	20.8
109	28.6	27.7	26.8	25.9	25.1	24.2	23.3	22.5	21.6	20.8
110	28.6	27.7	26.8	25.9	25.1	24.2	23.3	22.5	21.6	20.8
111	28.6	27.7	26.8	25.9	25.1	24.2	23.3	22.5	21.6	20.8
112	28.6	27.7	26.8	25.9	25.0	24.2	23.3	22.5	21.6	20.8
113	28.6	27.7	26.8	25.9	25.0	24.2	23.3	22.5	21.6	20.8
114	28.6	27.7	26.8	25.9	25.0	24.2	23.3	22.5	21.6	20.8
115	28.6	27.7	26.8	25.9	25.0	24.2	23.3	22.5	21.6	20.8

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	65	66	67	68	69	70	71	72	73	74
65	25.0	24.6	24.2	23.8	23.4	23.1	22.8	22.5	22.2	22.0
66	24.6	24.1	23.7	23.3	22.9	22.5	22.2	21.9	21.6	21.4
67	24.2	23.7	23.3	22.8	22.4	22.0	21.7	21.3	21.0	20.8
68	23.8	23.3	22.8	22.3	21.9	21.5	21.2	20.8	20.5	20.2
69	23.4	22.9	22.4	21.9	21.5	21.1	20.7	20.3	20.0	19.6
70	23.1	22.5	22.0	21.5	21.1	20.6	20.2	19.8	19.4	19.1
71	22.8	22.2	21.7	21.2	20.7	20.2	19.8	19.4	19.0	18.6
72	22.5	21.9	21.3	20.8	20.3	19.8	19.4	18.9	18.5	18.2
73	22.2	21.6	21.0	20.5	20.0	19.4	19.0	18.5	18.1	17.7
74	22.0	21.4	20.8	20.2	19.6	19.1	18.6	18.2	17.7	17.3
75	21.8	21.1	20.5	19.9	19.3	18.8	18.3	17.8	17.3	16.9
76	21.6	20.9	20.3	19.7	19.1	18.5	18.0	17.5	17.0	16.5
77	21.4	20.7	20.1	19.4	18.8	18.3	17.7	17.2	16.7	16.2
78	21.2	20.5	19.9	19.2	18.6	18.0	17.5	16.9	16.4	15.9
79	21.1	20.4	19.7	19.0	18.4	17.8	17.2	16.7	16.1	15.6
80	21.0	20.2	19.5	18.9	18.2	17.6	17.0	16.4	15.9	15.4
81	20.8	20.1	19.4	18.7	18.1	17.4	16.8	16.2	15.7	15.1
82	20.7	20.0	19.3	18.6	17.9	17.3	16.6	16.0	15.5	14.9
83	20.6	19.9	19.2	18.5	17.8	17.1	16.5	15.9	15.3	14.7
84	20.5	19.8	19.1	18.4	17.7	17.0	16.3	15.7	15.1	14.5
85	20.5	19.7	19.0	18.3	17.6	16.9	16.2	15.6	15.0	14.4
86	20.4	19.6	18.9	18.2	17.5	16.8	16.1	15.5	14.8	14.2
87	20.4	19.6	18.8	18.1	17.4	16.7	16.0	15.4	14.7	14.1
88	20.3	19.5	18.8	18.0	17.3	16.6	15.9	15.3	14.6	14.0
89	20.3	19.5	18.7	18.0	17.2	16.5	15.8	15.2	14.5	13.9
90	20.2	19.4	18.7	17.9	17.2	16.5	15.8	15.1	14.5	13.8
91	20.2	19.4	18.6	17.9	17.1	16.4	15.7	15.0	14.4	13.7
92	20.2	19.4	18.6	17.8	17.1	16.4	15.7	15.0	14.3	13.7
93	20.1	19.3	18.6	17.8	17.1	16.3	15.6	14.9	14.3	13.6
94	20.1	19.3	18.5	17.8	17.0	16.3	15.6	14.9	14.2	13.6
95	20.1	19.3	18.5	17.7	17.0	16.2	15.5	14.8	14.2	13.5
96	20.1	19.3	18.5	17.7	17.0	16.2	15.5	14.8	14.1	13.5
97	20.1	19.3	18.5	17.7	16.9	16.2	15.5	14.8	14.1	13.4
98	20.1	19.3	18.5	17.7	16.9	16.2	15.5	14.7	14.1	13.4
99	20.0	19.2	18.4	17.7	16.9	16.2	15.4	14.7	14.0	13.4
100	20.0	19.2	18.4	17.6	16.9	16.1	15.4	14.7	14.0	13.3
101	20.0	19.2	18.4	17.6	16.9	16.1	15.4	14.7	14.0	13.3
102	20.0	19.2	18.4	17.6	16.9	16.1	15.4	14.7	14.0	13.3
103	20.0	19.2	18.4	17.6	16.9	16.1	15.4	14.7	14.0	13.3
104	20.0	19.2	18.4	17.6	16.8	16.1	15.4	14.6	13.9	13.3
105	20.0	19.2	18.4	17.6	16.8	16.1	15.3	14.6	13.9	13.3
106	20.0	19.2	18.4	17.6	16.8	16.1	15.3	14.6	13.9	13.2
107	20.0	19.2	18.4	17.6	16.8	16.1	15.3	14.6	13.9	13.2
108	20.0	19.2	18.4	17.6	16.8	16.1	15.3	14.6	13.9	13.2
109	20.0	19.2	18.4	17.6	16.8	16.1	15.3	14.6	13.9	13.2

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	65	66	67	68	69	70	71	72	73	74
110.....	20.0	19.2	18.4	17.6	16.8	16.1	15.3	14.6	13.9	13.2
111.....	20.0	19.2	18.4	17.6	16.8	16.0	15.3	14.6	13.9	13.2
112.....	20.0	19.2	18.4	17.6	16.8	16.0	15.3	14.6	13.9	13.2
113.....	20.0	19.2	18.4	17.6	16.8	16.0	15.3	14.6	13.9	13.2
114.....	20.0	19.2	18.4	17.6	16.8	16.0	15.3	14.6	13.9	13.2
115.....	20.0	19.2	18.4	17.6	16.8	16.0	15.3	14.6	13.9	13.2

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	75	76	77	78	79	80	81	82	83	84
75.....	16.5	16.1	15.8	15.4	15.1	14.9	14.6	14.4	14.2	14.0
76.....	16.1	15.7	15.4	15.0	14.7	14.4	14.1	13.9	13.7	13.5
77.....	15.8	15.4	15.0	14.6	14.3	14.0	13.7	13.4	13.2	13.0
78.....	15.4	15.0	14.6	14.2	13.9	13.5	13.2	13.0	12.7	12.5
79.....	15.1	14.7	14.3	13.9	13.5	13.2	12.8	12.5	12.3	12.0
80.....	14.9	14.4	14.0	13.5	13.2	12.8	12.5	12.2	11.9	11.6
81.....	14.6	14.1	13.7	13.2	12.8	12.5	12.1	11.8	11.5	11.2
82.....	14.4	13.9	13.4	13.0	12.5	12.2	11.8	11.5	11.1	10.9
83.....	14.2	13.7	13.2	12.7	12.3	11.9	11.5	11.1	10.8	10.5
84.....	14.0	13.5	13.0	12.5	12.0	11.6	11.2	10.9	10.5	10.2
85.....	13.8	13.3	12.8	12.3	11.8	11.4	11.0	10.6	10.2	9.9
86.....	13.7	13.1	12.6	12.1	11.6	11.2	10.8	10.4	10.0	9.7
87.....	13.5	13.0	12.4	11.9	11.4	11.0	10.6	10.1	9.8	9.4
88.....	13.4	12.8	12.3	11.8	11.3	10.8	10.4	10.0	9.6	9.2
89.....	13.3	12.7	12.2	11.6	11.1	10.7	10.2	9.8	9.4	9.0
90.....	13.2	12.6	12.1	11.5	11.0	10.5	10.1	9.6	9.2	8.8
91.....	13.1	12.5	12.0	11.4	10.9	10.4	9.9	9.5	9.1	8.7
92.....	13.1	12.5	11.9	11.3	10.8	10.3	9.8	9.4	8.9	8.5
93.....	13.0	12.4	11.8	11.3	10.7	10.2	9.7	9.3	8.8	8.4
94.....	12.9	12.3	11.7	11.2	10.6	10.1	9.6	9.2	8.7	8.3
95.....	12.9	12.3	11.7	11.1	10.6	10.1	9.6	9.1	8.6	8.2
96.....	12.9	12.2	11.6	11.1	10.5	10.0	9.5	9.0	8.5	8.1
97.....	12.8	12.2	11.6	11.0	10.5	9.9	9.4	8.9	8.5	8.0
98.....	12.8	12.2	11.5	11.0	10.4	9.9	9.4	8.9	8.4	8.0
99.....	12.7	12.1	11.5	10.9	10.4	9.8	9.3	8.8	8.3	7.9
100.....	12.7	12.1	11.5	10.9	10.3	9.8	9.2	8.7	8.3	7.8
101.....	12.7	12.1	11.4	10.8	10.3	9.7	9.2	8.7	8.2	7.7
102.....	12.7	12.0	11.4	10.8	10.2	9.7	9.2	8.7	8.2	7.7
103.....	12.6	12.0	11.4	10.8	10.2	9.7	9.1	8.6	8.1	7.7
104.....	12.6	12.0	11.4	10.8	10.2	9.6	9.1	8.6	8.1	7.6
105.....	12.6	12.0	11.3	10.7	10.2	9.6	9.1	8.5	8.0	7.6
106.....	12.6	11.9	11.3	10.7	10.1	9.6	9.0	8.5	8.0	7.5
107.....	12.6	11.9	11.3	10.7	10.1	9.6	9.0	8.5	8.0	7.5
108.....	12.6	11.9	11.3	10.7	10.1	9.5	9.0	8.5	8.0	7.5
109.....	12.6	11.9	11.3	10.7	10.1	9.5	9.0	8.4	7.9	7.5
110.....	12.6	11.9	11.3	10.7	10.1	9.5	9.0	8.4	7.9	7.4
111.....	12.5	11.9	11.3	10.7	10.1	9.5	8.9	8.4	7.9	7.4
112.....	12.5	11.9	11.3	10.6	10.1	9.5	8.9	8.4	7.9	7.4
113.....	12.5	11.9	11.2	10.6	10.0	9.5	8.9	8.4	7.9	7.4
114.....	12.5	11.9	11.2	10.6	10.0	9.5	8.9	8.4	7.9	7.4
115.....	12.5	11.9	11.2	10.6	10.0	9.5	8.9	8.4	7.9	7.4

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	85	86	87	88	89	90	91	92	93	94
85.....	9.6	9.3	9.1	8.9	8.7	8.5	8.3	8.2	8.0	7.9
86.....	9.3	9.1	8.8	8.6	8.3	8.2	8.0	7.8	7.7	7.6
87.....	9.1	8.8	8.5	8.3	8.1	7.9	7.7	7.5	7.4	7.2
88.....	8.9	8.6	8.3	8.0	7.8	7.6	7.4	7.2	7.1	6.9
89.....	8.7	8.3	8.1	7.8	7.5	7.3	7.1	6.9	6.8	6.6
90.....	8.5	8.2	7.9	7.6	7.3	7.1	6.9	6.7	6.5	6.4
91.....	8.3	8.0	7.7	7.4	7.1	6.9	6.7	6.5	6.3	6.2
92.....	8.2	7.8	7.5	7.2	6.9	6.7	6.5	6.3	6.1	5.9
93.....	8.0	7.7	7.4	7.1	6.8	6.5	6.3	6.1	5.9	5.8
94.....	7.9	7.6	7.2	6.9	6.6	6.4	6.2	5.9	5.8	5.6
95.....	7.8	7.5	7.1	6.8	6.5	6.3	6.0	5.8	5.6	5.4
96.....	7.7	7.3	7.0	6.7	6.4	6.1	5.9	5.7	5.5	5.3
97.....	7.6	7.3	6.9	6.6	6.3	6.0	5.8	5.5	5.3	5.1
98.....	7.6	7.2	6.8	6.5	6.2	5.9	5.6	5.4	5.2	5.0
99.....	7.5	7.1	6.7	6.4	6.1	5.8	5.5	5.3	5.1	4.9
100.....	7.4	7.0	6.6	6.3	6.0	5.7	5.4	5.2	5.0	4.8
101.....	7.3	6.9	6.6	6.2	5.9	5.6	5.3	5.1	4.9	4.7
102.....	7.3	6.9	6.5	6.2	5.8	5.5	5.3	5.0	4.8	4.6
103.....	7.2	6.8	6.4	6.1	5.8	5.5	5.2	4.9	4.7	4.5
104.....	7.2	6.8	6.4	6.0	5.7	5.4	5.1	4.8	4.6	4.4
105.....	7.1	6.7	6.3	6.0	5.6	5.3	5.0	4.8	4.5	4.3
106.....	7.1	6.7	6.3	5.9	5.6	5.3	5.0	4.7	4.5	4.2
107.....	7.1	6.6	6.2	5.9	5.5	5.2	4.9	4.6	4.3	4.1
108.....	7.0	6.6	6.2	5.8	5.5	5.2	4.9	4.6	4.3	4.1
109.....	7.0	6.6	6.2	5.8	5.5	5.1	4.8	4.5	4.3	4.0
110.....	7.0	6.6	6.2	5.8	5.4	5.1	4.8	4.5	4.2	4.0
111.....	7.0	6.5	6.1	5.7	5.4	5.1	4.8	4.5	4.2	3.9
112.....	7.0	6.5	6.1	5.7	5.4	5.0	4.7	4.4	4.2	3.9
113.....	6.9	6.5	6.1	5.7	5.4	5.0	4.7	4.4	4.2	3.9
114.....	6.9	6.5	6.1	5.7	5.3	5.0	4.7	4.4	4.1	3.9

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	85	86	87	88	89	90	91	92	93	94
115	6.9	6.5	6.1	5.7	5.3	5.0	4.7	4.4	4.1	3.9

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	95	96	97	98	99	100	101	102	103	104
95	5.3	5.1	5.0	4.8	4.7	4.6	4.5	4.4	4.3	4.2
96	5.1	5.0	4.8	4.7	4.5	4.4	4.3	4.2	4.1	4.0
97	5.0	4.8	4.7	4.5	4.4	4.3	4.1	4.0	3.9	3.8
98	4.8	4.7	4.5	4.4	4.2	4.1	4.0	3.9	3.8	3.7
99	4.7	4.5	4.4	4.2	4.1	4.0	3.8	3.7	3.6	3.5
100	4.6	4.4	4.3	4.1	4.0	3.8	3.7	3.6	3.5	3.3
101	4.5	4.3	4.1	4.0	3.8	3.7	3.6	3.4	3.3	3.2
102	4.4	4.2	4.0	3.9	3.7	3.6	3.4	3.3	3.2	3.1
103	4.3	4.1	3.9	3.8	3.6	3.5	3.3	3.2	3.0	2.9
104	4.2	4.0	3.8	3.7	3.5	3.3	3.2	3.1	2.9	2.8
105	4.1	3.9	3.7	3.6	3.4	3.2	3.1	2.9	2.8	2.7
106	4.0	3.8	3.6	3.5	3.3	3.1	3.0	2.8	2.7	2.5
107	4.0	3.8	3.6	3.4	3.2	3.1	2.9	2.7	2.6	2.4
108	3.9	3.7	3.5	3.3	3.1	3.0	2.8	2.7	2.5	2.3
109	3.8	3.6	3.4	3.3	3.1	2.9	2.7	2.6	2.4	2.3
110	3.8	3.6	3.4	3.2	3.0	2.8	2.7	2.5	2.3	2.2
111	3.8	3.5	3.3	3.2	3.0	2.8	2.6	2.4	2.3	2.1
112	3.7	3.5	3.3	3.1	2.9	2.8	2.6	2.4	2.2	2.1
113	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.0
114	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.3	2.1	2.0
115	3.7	3.4	3.2	3.0	2.8	2.7	2.5	2.3	2.1	1.9

TABLE VI.—ORDINARY JOINT LIFE AND LAST SURVIVOR ANNUITIES; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	105	106	107	108	109	110	111	112	113	114	115
105	2.5	2.4	2.3	2.2	2.1	2.0	2.0	1.9	1.8	1.8	1.8
106	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.7	1.6	1.6
107	2.3	2.2	2.1	1.9	1.8	1.7	1.7	1.6	1.5	1.5	1.4
108	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.5	1.4	1.3	1.3
109	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1
110	2.0	1.9	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0
111	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	.9	.9
112	1.9	1.7	1.6	1.5	1.3	1.2	1.1	.9	.8	.8	.7
113	1.8	1.7	1.5	1.4	1.3	1.1	1.0	.9	.8	.7	.6
114	1.8	1.6	1.5	1.3	1.2	1.1	.9	.8	.7	.6	.5
115	1.8	1.6	1.4	1.3	1.1	1.0	.9	.8	.7	.6	.5

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	5	6	7	8	9	10	11	12	13	14
5	69.5	69.0	68.4	67.9	67.3	66.7	66.1	65.5	64.8	64.1
6	69.0	68.5	68.0	67.5	66.9	66.4	65.8	65.1	64.5	63.8
7	68.4	68.0	67.5	67.0	66.5	66.0	65.4	64.8	64.2	63.5
8	67.9	67.5	67.0	66.6	66.1	65.5	65.0	64.4	63.8	63.2
9	67.3	66.9	66.5	66.1	65.6	65.1	64.6	64.0	63.4	62.8
10	66.7	66.4	66.0	65.5	65.1	64.6	64.1	63.6	63.0	62.5
11	66.1	65.8	65.4	65.0	64.6	64.1	63.6	63.1	62.6	62.1
12	65.5	65.1	64.8	64.4	64.0	63.6	63.1	62.7	62.2	61.7
13	64.8	64.5	64.2	63.8	63.4	63.0	62.6	62.2	61.7	61.2
14	64.1	63.8	63.5	63.2	62.8	62.5	62.1	61.7	61.2	60.7
15	63.4	63.1	62.9	62.6	62.2	61.9	61.5	61.1	60.7	60.2
16	62.7	62.4	62.2	61.9	61.6	61.3	60.9	60.5	60.1	59.7
17	61.9	61.7	61.5	61.2	60.9	60.6	60.3	59.9	59.6	59.2
18	61.2	61.0	60.7	60.5	60.2	60.0	59.7	59.3	59.0	58.6
19	60.4	60.2	60.0	59.8	59.5	59.3	59.0	58.7	58.4	58.0
20	59.6	59.4	59.2	59.0	58.8	58.6	58.3	58.0	57.7	57.4
21	58.8	58.7	58.5	58.3	58.1	57.8	57.6	57.3	57.1	56.8
22	58.0	57.8	57.7	57.5	57.3	57.1	56.9	56.6	56.4	56.1
23	57.2	57.0	56.9	56.7	56.5	56.4	56.1	55.9	55.7	55.4
24	56.3	56.2	56.1	55.9	55.8	55.6	55.4	55.2	55.0	54.7
25	55.5	55.4	55.2	55.1	55.0	54.8	54.6	54.4	54.2	54.0
26	54.8	54.5	54.4	54.3	54.1	54.0	53.8	53.7	53.5	53.3
27	53.8	53.7	53.6	53.4	53.3	53.2	53.0	52.9	52.7	52.5
28	52.9	52.8	52.7	52.6	52.5	52.4	52.2	52.1	51.9	51.7
29	52.0	51.9	51.8	51.7	51.6	51.5	51.4	51.3	51.1	51.0
30	51.1	51.0	51.0	50.9	50.8	50.7	50.6	50.4	50.3	50.2
31	50.2	50.2	50.1	50.0	49.9	49.8	49.7	49.6	49.5	49.3
32	49.3	49.3	49.2	49.1	49.0	48.9	48.8	48.7	48.6	48.5
33	48.4	48.4	48.3	48.2	48.1	48.0	47.9	47.8	47.7	47.6
34	47.5	47.5	47.4	47.4	47.3	47.2	47.1	47.0	46.9	46.8
35	46.6	46.6	46.5	46.5	46.4	46.3	46.2	46.1	46.0	45.9
36	45.7	45.7	45.6	45.6	45.5	45.4	45.3	45.2	45.1	45.0
37	44.8	44.7	44.7	44.6	44.6	44.5	44.4	44.3	44.2	44.1
38	43.9	43.8	43.8	43.7	43.7	43.6	43.5	43.4	43.3	43.2
39	42.9	42.9	42.9	42.8	42.8	42.7	42.6	42.5	42.4	42.3
40	42.0	42.0	42.0	41.9	41.9	41.8	41.7	41.6	41.5	41.4
41	41.1	41.1	41.0	41.0	41.0	40.9	40.8	40.7	40.6	40.5
42	40.2	40.1	40.1	40.1	40.1	40.0	40.0	39.9	39.8	39.7

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	5	6	7	8	9	10	11	12	13	14
43	39.2	39.2	39.2	39.2	39.1	39.1	39.1	39.0	39.0	39.0
44	38.3	38.3	38.3	38.3	38.2	38.2	38.2	38.1	38.1	38.1
45	37.4	37.4	37.4	37.3	37.3	37.3	37.3	37.2	37.2	37.2
46	36.5	36.5	36.5	36.4	36.4	36.4	36.4	36.3	36.3	36.3
47	35.6	35.6	35.5	35.5	35.5	35.5	35.5	35.4	35.4	35.4
48	34.7	34.7	34.6	34.6	34.6	34.6	34.6	34.5	34.5	34.5
49	33.8	33.8	33.7	33.7	33.7	33.7	33.7	33.6	33.6	33.6
50	32.9	32.9	32.8	32.8	32.8	32.8	32.8	32.7	32.7	32.7
51	32.0	32.0	31.9	31.9	31.9	31.9	31.9	31.8	31.8	31.8
52	31.1	31.1	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0
53	30.2	30.2	30.2	30.2	30.1	30.1	30.1	30.1	30.1	30.1
54	29.3	29.3	29.3	29.3	29.3	29.2	29.2	29.2	29.2	29.2
55	28.4	28.4	28.4	28.4	28.4	28.4	28.4	28.3	28.3	28.3
56	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
57	26.7	26.7	26.7	26.6	26.6	26.6	26.6	26.6	26.6	26.6
58	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.7	25.7	25.7
59	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9	24.9
60	24.1	24.1	24.1	24.1	24.1	24.0	24.0	24.0	24.0	24.0
61	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2
62	22.4	22.4	22.4	22.4	22.4	22.4	22.3	22.3	22.3	22.3
63	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
64	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
65	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9	19.9
66	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1
67	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
68	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
69	16.8	16.8	16.8	16.7	16.7	16.7	16.7	16.7	16.7	16.7
70	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
71	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.2
72	14.6	14.6	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
73	13.9	13.9	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
74	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
75	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
76	11.9	11.9	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
77	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
78	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
79	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
80	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.4	9.4
81	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
82	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
83	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
84	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
85	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
86	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
87	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
88	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
89	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
90	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
91	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
92	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
93	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
94	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
95	3.7	3.7	3.7	3.7	3.7	3.7	3.6	3.6	3.6	3.6
96	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
97	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
98	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
99	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
100	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
101	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
102	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
103	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
104	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
105	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
106	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
107	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
108	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
109	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
110	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
111	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
112	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8
113	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
114	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6
115	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	15	16	17	18	19	20	21	22	23	24
15	59.8	59.3	58.8	58.2	57.6	57.0	56.4	55.8	55.1	54.5
16	59.3	58.8	58.3	57.8	57.2	56.7	56.1	55.5	54.8	54.2
17	58.8	58.3	57.8	57.3	56.8	56.3	55.7	55.1	54.5	53.9
18	58.2	57.8	57.3	56.9	56.4	55.9	55.3	54.7	54.2	53.5
19	57.6	57.2	56.8	56.4	55.9	55.4	54.9	54.4	53.8	53.2
20	57.0	56.7	56.3	55.9	55.4	54.9	54.5	53.9	53.4	52.8
21	56.4	56.1	55.7	55.3	54.9	54.5	54.0	53.5	53.0	52.4
22	55.8	55.5	55.1	54.7	54.4	53.9	53.5	53.0	52.5	52.0
23	55.1	54.8	54.5	54.2	53.8	53.4	53.0	52.5	52.1	51.6
24	54.5	54.2	53.9	53.5	53.2	52.8	52.4	52.0	51.6	51.1
25	53.8	53.5	53.2	52.9	52.6	52.2	51.9	51.5	51.1	50.6
26	53.0	52.8	52.5	52.3	52.0	51.6	51.3	50.9	50.5	50.1

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

[illegible]

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	25	26	27	28	29	30	31	32	33	34
25	50.2	49.7	49.2	48.6	48.1	47.5	46.9	46.2	45.6	44.9
26	49.7	49.2	48.7	48.2	47.7	47.1	46.5	45.9	45.3	44.6
27	49.2	48.7	48.3	47.8	47.3	46.7	46.2	45.6	45.0	44.3
28	48.6	48.2	47.8	47.3	46.8	46.3	45.8	45.2	44.6	44.0
29	48.1	47.7	47.3	46.8	46.4	45.9	45.4	44.8	44.3	43.7
30	47.5	47.1	46.7	46.3	45.9	45.4	44.9	44.4	43.9	43.3
31	46.9	46.5	46.2	45.8	45.4	44.9	44.5	44.0	43.5	42.9
32	46.2	45.9	45.6	45.2	44.8	44.4	44.0	43.5	43.0	42.5
33	45.6	45.3	45.0	44.6	44.3	43.9	43.5	43.0	42.6	42.1
34	44.9	44.6	44.3	44.0	43.7	43.3	42.9	42.5	42.1	41.6
35	44.2	44.0	43.7	43.4	43.1	42.7	42.4	42.0	41.6	41.1
36	43.5	43.3	43.0	42.7	42.4	42.1	41.8	41.4	41.0	40.6
37	42.8	42.5	42.3	42.1	41.8	41.5	41.2	40.8	40.5	40.1
38	42.0	41.8	41.6	41.4	41.1	40.8	40.6	40.2	39.9	39.5
39	41.3	41.1	40.9	40.7	40.4	40.2	39.9	39.6	39.3	39.0
40	40.5	40.3	40.1	39.9	39.7	39.5	39.2	39.0	38.7	38.4
41	39.7	39.5	39.4	39.2	39.0	38.8	38.5	38.3	38.0	37.7
42	38.9	38.8	38.6	38.4	38.3	38.1	37.8	37.6	37.4	37.1
43	38.1	38.0	37.8	37.7	37.5	37.3	37.1	36.9	36.7	36.4
44	37.3	37.2	37.0	36.9	36.7	36.6	36.4	36.2	36.0	35.8
45	36.5	36.3	36.2	36.1	36.0	35.8	35.6	35.5	35.3	35.1
46	35.6	35.5	35.4	35.3	35.2	35.0	34.9	34.7	34.5	34.4
47	34.8	34.7	34.6	34.5	34.4	34.3	34.1	34.0	33.8	33.6
48	34.0	33.9	33.8	33.7	33.6	33.5	33.4	33.2	33.1	32.9
49	33.1	33.0	33.0	32.9	32.8	32.7	32.6	32.4	32.3	32.2
50	32.3	32.2	32.1	32.1	32.0	31.9	31.8	31.7	31.5	31.4
51	31.4	31.4	31.3	31.2	31.2	31.1	31.0	30.9	30.8	30.6
52	30.6	30.5	30.5	30.4	30.3	30.3	30.2	30.1	30.0	29.9
53	29.7	29.7	29.6	29.6	29.5	29.5	29.4	29.3	29.2	29.1
54	28.9	28.9	28.8	28.8	28.7	28.6	28.6	28.5	28.4	28.3
55	28.1	28.0	28.0	27.9	27.9	27.8	27.8	27.7	27.6	27.5
56	27.2	27.2	27.1	27.1	27.0	27.0	26.9	26.9	26.8	26.7
57	26.4	26.3	26.3	26.3	26.2	26.2	26.1	26.1	26.0	25.9
58	25.5	25.5	25.5	25.4	25.4	25.4	25.3	25.3	25.2	25.1
59	24.7	24.7	24.6	24.6	24.6	24.5	24.5	24.5	24.4	24.3
60	23.9	23.8	23.8	23.8	23.8	23.7	23.7	23.6	23.6	23.5
61	23.0	23.0	23.0	23.0	22.9	22.9	22.9	22.8	22.8	22.7
62	22.2	22.2	22.2	22.1	22.1	22.1	22.1	22.0	22.0	21.9
63	21.4	21.4	21.3	21.3	21.3	21.3	21.3	21.2	21.2	21.2
64	20.6	20.6	20.5	20.5	20.5	20.5	20.5	20.4	20.4	20.4
65	19.8	19.8	19.7	19.7	19.7	19.7	19.7	19.6	19.6	19.6
66	19.0	19.0	19.0	18.9	18.9	18.9	18.9	18.9	18.8	18.8
67	18.2	18.2	18.2	18.2	18.2	18.2	18.1	18.1	18.1	18.1
68	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.3	17.3	17.3
69	16.7	16.7	16.7	16.6	16.6	16.6	16.6	16.6	16.6	16.6
70	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.8	15.8
71	15.2	15.2	15.2	15.2	15.2	15.2	15.2	15.1	15.1	15.1
72	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.4	14.4	14.4
73	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.7	13.7
74	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1
75	12.5	12.5	12.5	12.4	12.4	12.4	12.4	12.4	12.4	12.4
76	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
77	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.1
78	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.5
79	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
80	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
81	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
82	8.4	8.4	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
83	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
84	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
85	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
86	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
87	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
88	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
89	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
90	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
91	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
92	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
93	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
94	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
95	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
96	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
97	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
98	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
99	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
100	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
101	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
102	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
103	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
104	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
105	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
106	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
107	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
108	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
109	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
110	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
111	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
112	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8
113	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
114	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6
115	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	35	36	37	38	39	40	41	42	43	44
35	40.7	40.2	39.7	39.2	38.6	38.0	37.4	36.8	36.2	35.5
36	40.2	39.7	39.3	38.7	38.2	37.7	37.1	36.5	35.9	35.2
37	39.7	39.3	38.8	38.3	37.8	37.3	36.7	36.2	35.6	34.9
38	39.2	38.7	38.3	37.9	37.4	36.9	36.3	35.8	35.2	34.6
39	38.6	38.2	37.8	37.4	36.9	36.4	35.9	35.4	34.9	34.3
40	38.0	37.7	37.3	36.9	36.4	36.0	35.5	35.0	34.5	34.0
41	37.4	37.1	36.7	36.3	35.9	35.5	35.1	34.6	34.1	33.6
42	36.8	36.5	36.2	35.8	35.4	35.0	34.6	34.1	33.7	33.2
43	36.2	35.9	35.6	35.2	34.9	34.5	34.1	33.7	33.2	32.8
44	35.5	35.2	34.9	34.6	34.3	34.0	33.6	33.2	32.8	32.3
45	34.8	34.6	34.3	34.0	33.7	33.4	33.0	32.7	32.3	31.8
46	34.1	33.9	33.7	33.4	33.1	32.8	32.5	32.1	31.8	31.4
47	33.4	33.2	33.0	32.8	32.5	32.2	31.9	31.6	31.2	30.8
48	32.7	32.5	32.3	32.1	31.8	31.6	31.3	31.0	30.7	30.3
49	32.0	31.8	31.6	31.4	31.2	30.9	30.7	30.4	30.1	29.8
50	31.3	31.1	30.9	30.7	30.5	30.3	30.0	29.8	29.5	29.2
51	30.5	30.4	30.2	30.0	29.8	29.6	29.4	29.2	28.9	28.6
52	29.7	29.6	29.5	29.3	29.1	28.9	28.7	28.5	28.3	28.0
53	29.0	28.9	28.7	28.6	28.4	28.2	28.1	27.9	27.6	27.4
54	28.2	28.1	28.0	27.8	27.7	27.5	27.4	27.2	27.0	26.8
55	27.4	27.3	27.2	27.1	27.0	26.8	26.7	26.5	26.3	26.1
56	26.7	26.6	26.5	26.3	26.2	26.1	26.0	25.8	25.6	25.4
57	25.9	25.8	25.7	25.6	25.5	25.4	25.2	25.1	24.9	24.8
58	25.1	25.0	24.9	24.8	24.7	24.6	24.5	24.4	24.2	24.1
59	24.3	24.2	24.1	24.1	24.0	23.9	23.8	23.6	23.5	23.4
60	23.5	23.4	23.4	23.3	23.2	23.1	23.0	22.9	22.8	22.7
61	22.7	22.6	22.6	22.5	22.4	22.4	22.3	22.2	22.1	22.0
62	21.9	21.9	21.8	21.7	21.7	21.6	21.5	21.4	21.3	21.2
63	21.1	21.1	21.0	21.0	20.9	20.8	20.8	20.7	20.6	20.5
64	20.3	20.3	20.2	20.2	20.1	20.1	20.0	20.0	19.9	19.8
65	19.6	19.5	19.5	19.4	19.4	19.3	19.3	19.2	19.1	19.1
66	18.8	18.8	18.7	18.7	18.6	18.6	18.5	18.5	18.4	18.4
67	18.0	18.0	18.0	17.9	17.9	17.9	17.8	17.8	17.7	17.6
68	17.3	17.3	17.2	17.2	17.2	17.1	17.1	17.0	17.0	16.9
69	16.5	16.5	16.5	16.5	16.4	16.4	16.4	16.3	16.3	16.2
70	15.8	15.8	15.8	15.7	15.7	15.7	15.6	15.6	15.6	15.5
71	15.1	15.1	15.1	15.0	15.0	15.0	15.0	14.9	14.9	14.9
72	14.4	14.4	14.4	14.3	14.3	14.3	14.3	14.2	14.2	14.2
73	13.7	13.7	13.7	13.7	13.7	13.6	13.6	13.6	13.6	13.5
74	13.1	13.0	13.0	13.0	13.0	13.0	13.0	12.9	12.9	12.9
75	12.4	12.4	12.4	12.4	12.3	12.3	12.3	12.3	12.3	12.2
76	11.8	11.8	11.7	11.7	11.7	11.7	11.7	11.7	11.6	11.6
77	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.0	11.0
78	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.4
79	10.0	10.0	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
80	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.3	9.3	9.3
81	8.9	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
82	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
83	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
84	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
85	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
86	6.5	6.5	6.5	6.5	6.4	6.4	6.4	6.4	6.4	6.4
87	6.1	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
88	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.6	5.6	5.6
89	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
90	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
91	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.6	4.6
92	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
93	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
94	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
95	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
96	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
97	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
98	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
99	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
100	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.6
101	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
102	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
103	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
104	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
105	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
106	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
107	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
108	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
109	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
110	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
111	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
112	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8
113	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
114	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6
115	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	45	46	47	48	49	50	51	52	53	54
45	31.4	30.9	30.5	30.0	29.4	28.9	28.3	27.7	27.1	26.5
46	30.9	30.5	30.0	29.6	29.1	28.5	28.0	27.4	26.9	26.3
47	30.5	30.0	29.6	29.2	28.7	28.2	27.7	27.1	26.6	26.0
48	30.0	29.6	29.2	28.7	28.3	27.8	27.3	26.8	26.3	25.7

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	45	46	47	48	49	50	51	52	53	54
49	29.4	29.1	28.7	28.3	27.9	27.4	26.9	26.5	25.9	25.4
50	28.9	28.5	28.2	27.4	27.4	27.0	26.5	26.1	25.6	25.1
51	28.3	28.0	27.7	27.3	26.9	26.5	26.1	25.7	25.2	24.7
52	27.7	27.4	27.1	26.8	26.5	26.1	25.7	25.3	24.8	24.4
53	27.1	26.9	26.6	26.3	25.9	25.6	25.2	24.8	24.4	24.0
54	26.5	26.3	26.0	25.7	25.4	25.1	24.7	24.4	24.0	23.6
55	25.9	25.7	25.4	25.1	24.9	24.6	24.2	23.9	23.5	23.2
56	25.2	25.0	24.8	24.6	24.3	24.0	23.7	23.4	23.1	22.7
57	24.6	24.4	24.2	24.0	23.7	23.5	23.2	22.9	22.6	22.2
58	23.9	23.7	23.5	23.3	23.1	22.9	22.6	22.4	22.1	21.7
59	23.2	23.1	22.9	22.7	22.5	22.3	22.1	21.8	21.5	21.2
60	22.5	22.4	22.2	22.1	21.9	21.7	21.5	21.2	21.0	20.7
61	21.8	21.7	21.6	21.4	21.2	21.1	20.9	20.6	20.4	20.2
62	21.1	21.0	20.9	20.7	20.6	20.4	20.2	20.0	19.8	19.6
63	20.4	20.3	20.2	20.1	19.9	19.8	19.6	19.4	19.2	19.0
64	19.7	19.6	19.5	19.4	19.3	19.1	19.0	18.8	18.6	18.5
65	19.0	18.9	18.8	18.7	18.6	18.5	18.3	18.2	18.0	17.9
66	18.3	18.2	18.1	18.0	17.9	17.8	17.7	17.6	17.4	17.3
67	17.6	17.5	17.4	17.3	17.2	17.1	17.0	16.9	16.8	16.7
68	16.9	16.8	16.7	16.6	16.5	16.4	16.3	16.2	16.1	16.0
69	16.2	16.1	16.1	16.0	15.9	15.8	15.7	15.6	15.4	15.3
70	15.5	15.4	15.4	15.3	15.3	15.2	15.1	15.0	14.9	14.8
71	14.8	14.8	14.7	14.7	14.6	14.5	14.5	14.4	14.3	14.2
72	14.1	14.1	14.1	14.0	14.0	13.9	13.8	13.8	13.7	13.6
73	13.5	13.5	13.4	13.4	13.3	13.3	13.2	13.2	13.1	13.0
74	12.8	12.8	12.8	12.7	12.7	12.7	12.6	12.6	12.5	12.4
75	12.2	12.2	12.2	12.1	12.1	12.1	12.0	12.0	11.9	11.8
76	11.6	11.6	11.6	11.5	11.5	11.5	11.4	11.4	11.3	11.2
77	11.0	11.0	11.0	10.9	10.9	10.9	10.8	10.8	10.7	10.6
78	10.4	10.4	10.4	10.4	10.3	10.3	10.3	10.2	10.2	10.1
79	9.9	9.8	9.8	9.8	9.8	9.8	9.7	9.7	9.6	9.5
80	9.3	9.3	9.3	9.3	9.2	9.2	9.2	9.2	9.1	9.0
81	8.8	8.8	8.7	8.7	8.7	8.7	8.7	8.7	8.6	8.5
82	8.3	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.1	8.0
83	7.8	7.8	7.7	7.7	7.7	7.7	7.7	7.7	7.6	7.5
84	7.3	7.3	7.3	7.3	7.3	7.2	7.2	7.2	7.2	7.1
85	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.7
86	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.3	6.3
87	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.9
88	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.5
89	5.3	5.3	5.3	5.3	5.3	5.3	5.2	5.2	5.2	5.1
90	5.0	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.8
91	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5
92	4.4	4.4	4.4	4.3	4.3	4.3	4.3	4.3	4.3	4.2
93	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.0
94	3.9	3.9	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.7
95	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5
96	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3
97	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1
98	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.9
99	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7
100	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5
101	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.4
102	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2
103	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0
104	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8
105	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7
106	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5
107	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3
108	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2
109	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0
110	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
111	.9	.9	.9	.9	.9	.9	.9	.9	.9	.8
112	.8	.8	.8	.8	.8	.8	.8	.8	.8	.7
113	.7	.7	.7	.7	.7	.7	.7	.7	.7	.6
114	.6	.6	.6	.6	.6	.6	.6	.6	.6	.5
115	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	55	56	57	58	59	60	61	62	63	64
55	22.7	22.3	21.9	21.4	20.9	20.4	19.9	19.4	18.8	18.3
56	22.3	21.9	21.5	21.1	20.6	20.1	19.6	19.1	18.6	18.0
57	21.9	21.5	21.1	20.7	20.3	19.8	19.3	18.8	18.3	17.8
58	21.4	21.1	20.7	20.3	19.9	19.5	19.0	18.5	18.0	17.5
59	20.9	20.6	20.3	19.9	19.5	19.1	18.7	18.2	17.7	17.3
60	20.4	20.1	19.8	19.5	19.1	18.7	18.3	17.9	17.5	17.0
61	19.9	19.6	19.3	19.0	18.7	18.3	17.9	17.5	17.1	16.7
62	19.4	19.1	18.8	18.5	18.2	17.9	17.5	17.1	16.8	16.3
63	18.8	18.6	18.3	18.0	17.7	17.4	17.1	16.8	16.4	16.0
64	18.3	18.0	17.8	17.5	17.3	17.0	16.7	16.3	16.0	15.6
65	17.7	17.5	17.3	17.0	16.8	16.5	16.2	15.9	15.6	15.3
66	17.1	16.9	16.7	16.5	16.3	16.0	15.8	15.5	15.2	14.9
67	16.5	16.3	16.2	16.0	15.8	15.5	15.3	15.0	14.7	14.5
68	15.9	15.8	15.6	15.4	15.2	15.0	14.8	14.6	14.3	14.0
69	15.3	15.2	15.0	14.9	14.7	14.5	14.3	14.1	13.9	13.6
70	14.7	14.6	14.5	14.3	14.2	14.0	13.8	13.6	13.4	13.2
71	14.1	14.0	13.9	13.8	13.6	13.5	13.3	13.1	12.9	12.7
72	13.5	13.4	13.3	13.2	13.1	12.9	12.8	12.6	12.4	12.3

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

Ages	55	56	57	58	59	60	61	62	63	64
73	13.0	12.9	12.8	12.7	12.5	12.4	12.3	12.1	12.0	11.8
74	12.4	12.3	12.2	12.1	12.0	11.9	11.8	11.6	11.5	11.3
75	11.8	11.7	11.6	11.5	11.4	11.3	11.2	11.1	11.0	10.9
76	11.2	11.1	11.0	10.9	10.8	10.7	10.6	10.5	10.4	10.3
77	10.7	10.6	10.5	10.4	10.3	10.2	10.1	10.0	9.9	9.8
78	10.1	10.0	9.9	9.8	9.7	9.6	9.5	9.4	9.3	9.2
79	9.6	9.5	9.4	9.3	9.2	9.1	9.0	8.9	8.8	8.7
80	9.1	9.0	8.9	8.8	8.7	8.6	8.5	8.4	8.3	8.2
81	8.6	8.5	8.4	8.3	8.2	8.1	8.0	7.9	7.8	7.7
82	8.1	8.0	7.9	7.8	7.7	7.6	7.5	7.4	7.3	7.2
83	7.6	7.5	7.4	7.3	7.2	7.1	7.0	6.9	6.8	6.7
84	7.2	7.1	7.0	6.9	6.8	6.7	6.6	6.5	6.4	6.3
85	6.7	6.6	6.5	6.4	6.3	6.2	6.1	6.0	5.9	5.8
86	6.3	6.2	6.1	6.0	5.9	5.8	5.7	5.6	5.5	5.4
87	5.9	5.8	5.7	5.6	5.5	5.4	5.3	5.2	5.1	5.0
88	5.6	5.5	5.4	5.3	5.2	5.1	5.0	4.9	4.8	4.7
89	5.2	5.1	5.0	4.9	4.8	4.7	4.6	4.5	4.4	4.3
90	4.9	4.8	4.7	4.6	4.5	4.4	4.3	4.2	4.1	4.0
91	4.6	4.5	4.4	4.3	4.2	4.1	4.0	3.9	3.8	3.7
92	4.3	4.2	4.1	4.0	3.9	3.8	3.7	3.6	3.5	3.4
93	4.1	4.0	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2
94	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9
95	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7
96	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5
97	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3
98	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1
99	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9
100	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7
101	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.6
102	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4
103	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2
104	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0
105	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9
106	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7
107	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5
108	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4
109	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2
110	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
111	.9	.8	.7	.6	.5	.4	.3	.2	.1	0
112	.8	.7	.6	.5	.4	.3	.2	.1	0	0
113	.7	.6	.5	.4	.3	.2	.1	0	0	0
114	.6	.5	.4	.3	.2	.1	0	0	0	0
115	.5	.4	.3	.2	.1	0	0	0	0	0

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

Ages	65	66	67	68	69	70	71	72	73	74
65	14.9	14.5	14.1	13.7	13.3	12.9	12.5	12.0	11.6	11.2
66	14.5	14.2	13.8	13.4	13.1	12.6	12.2	11.8	11.4	11.0
67	14.1	13.8	13.5	13.1	12.8	12.4	12.0	11.6	11.2	10.8
68	13.7	13.4	13.1	12.8	12.5	12.1	11.7	11.3	10.9	10.5
69	13.3	13.1	12.8	12.5	12.1	11.8	11.4	11.1	10.7	10.4
70	12.9	12.6	12.4	12.1	11.8	11.5	11.2	10.9	10.5	10.1
71	12.5	12.2	12.0	11.7	11.4	11.1	10.8	10.5	10.2	9.9
72	12.0	11.8	11.6	11.4	11.1	10.8	10.5	10.2	9.9	9.6
73	11.6	11.4	11.2	11.0	10.7	10.5	10.2	9.9	9.7	9.4
74	11.2	11.0	10.8	10.6	10.4	10.1	9.9	9.6	9.4	9.1
75	10.7	10.5	10.4	10.2	10.0	9.8	9.5	9.3	9.1	8.8
76	10.3	10.1	9.9	9.8	9.6	9.4	9.2	9.0	8.8	8.5
77	9.8	9.7	9.5	9.4	9.2	9.0	8.8	8.6	8.4	8.2
78	9.4	9.2	9.1	9.0	8.8	8.7	8.5	8.3	8.1	7.9
79	8.9	8.8	8.7	8.6	8.4	8.3	8.1	8.0	7.8	7.6
80	8.5	8.4	8.3	8.2	8.0	7.9	7.8	7.6	7.5	7.3
81	8.0	8.0	7.9	7.9	7.7	7.5	7.4	7.3	7.1	7.0
82	7.6	7.5	7.4	7.3	7.2	7.1	6.9	6.8	6.7	6.5
83	7.2	7.1	7.0	6.9	6.8	6.7	6.6	6.5	6.4	6.2
84	6.8	6.7	6.6	6.5	6.4	6.3	6.2	6.1	6.0	5.8
85	6.4	6.3	6.2	6.1	6.0	5.9	5.8	5.7	5.6	5.4
86	6.0	6.0	5.9	5.8	5.7	5.6	5.5	5.4	5.3	5.2
87	5.7	5.6	5.5	5.4	5.3	5.2	5.1	5.0	4.9	4.8
88	5.3	5.3	5.2	5.1	5.0	4.9	4.8	4.7	4.6	4.4
89	5.0	5.0	4.9	4.8	4.7	4.6	4.5	4.4	4.3	4.1
90	4.7	4.6	4.5	4.4	4.3	4.2	4.1	4.0	3.9	3.8
91	4.5	4.4	4.3	4.2	4.1	4.0	3.9	3.8	3.7	3.6
92	4.2	4.1	4.0	3.9	3.8	3.7	3.6	3.5	3.4	3.3
93	3.9	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0
94	3.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8
95	3.5	3.4	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6
96	3.3	3.2	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4
97	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2
98	2.9	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0
99	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9
100	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7
101	2.4	2.3	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5
102	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3
103	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2
104	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0
105	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.8
106	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

[illegible]

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

[illegible]

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

[illegible]

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES—Continued

[illegible]

TABLE VIA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

[illegible]

TABLE VIAA.—ANNUITIES FOR JOINT LIFE ONLY; TWO LIVES—EXPECTED RETURN MULTIPLES

[illegible]

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT

[illegible]

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT—Continued

Age	Years—									
	1	2	3	4	5	6	7	8	9	10
26	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	1
38	0	0	0	0	0	0	0	0	0	1
39	0	0	0	0	0	0	0	0	1	1
40	0	0	0	0	0	0	0	1	1	1
41	0	0	0	0	0	0	1	1	1	1
42	0	0	0	0	0	0	1	1	1	1
43	0	0	0	0	0	0	1	1	1	1
44	0	0	0	0	0	1	1	1	1	1
45	0	0	0	0	0	1	1	1	1	1
46	0	0	0	0	1	1	1	1	1	1
47	0	0	0	0	1	1	1	1	1	1
48	0	0	0	1	1	1	1	1	1	2
49	0	0	0	1	1	1	1	1	1	2
50	0	0	0	1	1	1	1	1	2	2
51	0	0	0	1	1	1	1	1	2	2
52	0	0	0	1	1	1	1	1	2	2
53	0	0	1	1	1	1	1	2	2	2
54	0	0	1	1	1	1	1	2	2	2
55	0	0	1	1	1	1	2	2	2	3
56	0	0	1	1	1	1	2	2	3	3
57	0	0	1	1	1	2	2	2	3	3
58	0	1	1	1	1	2	2	2	3	4
59	0	1	1	1	1	2	2	3	3	4
60	0	1	1	1	2	2	2	3	3	4
61	0	1	1	1	2	2	3	3	4	5
62	0	1	1	2	2	3	3	4	5	5
63	0	1	1	2	2	3	4	4	5	6
64	0	1	1	2	2	3	4	5	6	6
65	0	1	2	2	3	3	4	5	6	7
66	1	1	2	2	3	4	5	6	7	8
67	1	1	2	3	3	4	5	6	7	8
68	1	1	2	3	4	5	6	7	8	10
69	1	1	2	3	4	5	6	7	8	9
70	1	2	3	4	5	6	7	8	9	10
71	1	2	3	4	5	6	8	9	10	11
72	1	2	3	4	5	6	7	8	10	11
73	1	2	4	5	6	8	9	11	13	14
74	1	3	4	5	6	8	9	11	13	15
75	1	3	4	5	7	9	10	12	15	17
76	2	3	5	7	9	12	14	16	18	21
77	2	4	5	7	9	12	14	16	20	23
78	2	4	6	8	10	13	15	18	21	24
79	2	4	7	9	11	14	17	20	23	26
80	2	5	7	10	13	15	18	21	24	29
81	3	5	8	11	14	17	20	23	26	29
82	3	6	9	12	15	19	22	25	28	32
83	3	7	10	13	17	20	24	27	31	34
84	4	7	11	15	19	22	26	30	33	37
85	4	8	12	16	20	24	28	32	36	40
86	4	9	13	18	22	27	31	35	39	42
87	5	10	15	20	24	29	33	37	41	45
88	5	11	16	21	26	31	36	40	44	48
89	6	12	18	23	28	33	38	43	47	50
90	7	13	19	25	31	36	41	45	49	53
91	7	14	21	27	33	38	43	48	52	55
92	8	15	22	29	35	40	45	50	54	58
93	9	17	24	31	37	43	48	52	56	60
94	9	18	26	33	39	45	50	54	58	62
95	10	19	27	35	41	47	52	57	60	64
96	11	20	29	36	43	49	54	59	62	66
97	11	21	30	38	45	51	56	61	64	68
98	12	23	32	40	47	53	58	63	66	69
99	13	24	34	42	49	55	60	65	68	71
100	14	26	36	44	52	58	63	67	70	73
101	14	27	38	47	54	60	65	69	72	75
102	15	29	40	49	56	62	67	71	74	77
103	17	31	42	52	59	65	69	73	76	78
104	18	33	45	55	62	67	72	75	78	80
105	19	36	48	58	65	70	74	77	80	82
106	21	38	51	61	68	73	77	79	82	84
107	23	42	55	64	71	76	79	81	83	85
108	25	45	58	67	73	78	81	83	85	87
109	28	49	62	71	76	80	83	85	87	88
110	31	52	66	74	79	82	85	87	88	89
111	34	57	70	77	82	85	87	88	89	91
112	37	61	73	80	84	87	88	90	91	92
113	41	66	77	83	86	88	90	91	92	93
114	45	70	80	85	88	90	92	93	93	94

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT—Continued

Age	Years—									
	1	2	3	4	5	6	7	8	9	10
115	50	75	83	88	90	92	93	94	94	95

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT

Age	Years—									
	11	12	13	14	15	16	17	18	19	20
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	1
22	0	0	0	0	0	0	0	0	0	1
23	0	0	0	0	0	0	0	0	1	1
24	0	0	0	0	0	0	0	1	1	1
25	0	0	0	0	0	0	0	1	1	1
26	0	0	0	0	0	0	1	1	1	1
27	0	0	0	0	0	0	1	1	1	1
28	0	0	0	0	0	1	1	1	1	1
29	0	0	0	0	1	1	1	1	1	1
30	0	0	0	1	1	1	1	1	1	1
31	0	0	0	1	1	1	1	1	1	1
32	0	0	1	1	1	1	1	1	1	1
33	0	0	1	1	1	1	1	1	1	1
34	0	1	1	1	1	1	1	1	1	1
35	0	1	1	1	1	1	1	1	1	1
36	1	1	1	1	1	1	1	1	1	1
37	1	1	1	1	1	1	1	1	1	1
38	1	1	1	1	1	1	1	1	1	1
39	1	1	1	1	1	1	1	1	1	2
40	1	1	1	1	1	1	1	1	2	2
41	1	1	1	1	1	1	1	2	2	2
42	1	1	1	1	1	1	2	2	2	2
43	1	1	1	1	2	2	2	2	2	3
44	1	1	1	2	2	2	2	2	3	3
45	1	2	2	2	2	2	2	3	3	3
46	1	2	2	2	2	2	3	3	3	3
47	2	2	2	2	2	3	3	3	4	4
48	2	2	2	2	3	3	3	4	4	4
49	2	2	2	3	3	3	4	4	5	5
50	2	2	3	3	3	4	4	5	5	5
51	2	2	3	3	3	4	5	5	6	7
52	2	2	3	3	3	4	5	6	7	7
53	2	3	3	4	4	5	5	6	7	8
54	3	3	4	4	5	5	6	7	8	9
55	3	3	4	5	5	6	7	8	9	10
56	3	4	5	5	6	7	8	9	10	11
57	4	5	6	6	7	8	9	10	11	13
58	4	5	6	7	8	9	10	11	12	14
59	5	6	7	8	9	10	11	12	13	15
60	5	6	7	8	9	10	11	12	13	17
61	6	7	8	9	10	11	12	13	14	18
62	6	8	9	10	11	12	13	14	15	20
63	7	9	10	11	12	13	14	15	16	22
64	7	10	11	12	13	14	15	16	17	24
65	8	11	12	13	14	15	16	17	18	26
66	8	12	13	14	15	16	17	18	19	28
67	9	13	14	15	16	17	18	19	20	30
68	10	14	15	16	17	18	19	20	21	32
69	11	15	16	17	18	19	20	21	22	35
70	12	16	17	18	19	20	21	22	23	37
71	13	17	18	19	20	21	22	23	24	40
72	14	18	19	20	21	22	23	24	25	43
73	15	19	20	21	22	23	24	25	26	45
74	16	20	21	22	23	24	25	26	27	48
75	18	22	23	24	25	26	27	28	29	51
76	19	23	24	25	26	27	28	29	30	53
77	21	25	26	27	28	29	30	31	32	56
78	23	27	28	29	30	31	32	33	34	58
79	25	29	30	31	32	33	34	35	36	61
80	28	32	33	34	35	36	37	38	39	63
81	30	34	35	36	37	38	39	40	41	
82	32	36	37	38	39	40	41	42	43	
83	35	39	40	41	42	43	44	45	46	
84	38	41	42	43	44	45	46	47	48	

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT—Continued

Age	Years—									
	11	12	13	14	15	16	17	18	19	20
85	43	46	49	52	55	57	59	62	63	65
86	46	49	52	55	57	60	62	64	66	67
87	48	52	55	57	60	62	64	66	68	69
88	51	54	57	60	62	64	66	68	70	71
89	54	57	60	62	65	67	68	70	72	73
90	56	59	62	64	67	69	70	72	74	75
91	59	62	64	67	69	71	72	74	75	76
92	61	64	66	69	71	72	74	75	77	78
93	63	66	68	70	72	74	75	77	78	79
94	65	68	70	72	74	75	77	78	79	80
95	67	69	72	74	75	77	78	79	81	82
96	69	71	73	75	77	78	80	81	82	83
97	70	73	75	77	78	80	81	82	83	84
98	72	74	76	78	79	81	82	83	84	85
99	74	76	78	79	81	82	83	84	85	86
100	75	78	79	81	82	83	84	85	86	86
101	77	79	81	82	83	84	85	86	87	87
102	79	81	82	83	84	85	86	87	88	88
103	80	82	83	85	86	87	87	88	89	89
104	82	84	85	86	87	88	88	89	90	90
105	84	85	86	87	88	89	89	90	90	91
106	85	86	87	88	89	90	90	91	91	92
107	87	88	89	89	90	91	91	92	92	93
108	88	89	90	90	91	92	92	93	93	93
109	89	90	91	92	92	93	93	93	94	94
110	90	91	92	92	93	93	94	94	94	95
111	92	92	93	93	94	94	95	95	95	95
112	93	93	94	94	95	95	95	96	96	96
113	94	94	95	95	95	96	96	96	96	97
114	95	95	95	96	96	96	97	97	97	97
115	95	96	96	96	97	97	97	97	97	98

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT

Age	Years—									
	21	22	23	24	25	26	27	28	29	30
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	1
9	0	0	0	0	0	0	0	0	1	1
10	0	0	0	0	0	0	0	1	1	1
11	0	0	0	0	0	0	1	1	1	1
12	0	0	0	0	0	0	1	1	1	1
13	0	0	0	0	0	1	1	1	1	1
14	0	0	0	0	1	1	1	1	1	1
15	0	0	0	1	1	1	1	1	1	1
16	0	0	1	1	1	1	1	1	1	1
17	0	0	1	1	1	1	1	1	1	1
18	0	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1
22	1	1	1	1	1	1	1	1	1	1
23	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1	1	1	2
28	1	1	1	1	1	1	1	1	2	2
29	1	1	1	1	1	1	1	2	2	2
30	1	1	1	1	1	1	2	2	2	2
31	1	1	1	1	1	2	2	2	2	2
32	1	1	1	1	2	2	2	2	2	2
33	1	1	1	2	2	2	2	2	2	2
34	1	1	2	2	2	2	2	2	3	3
35	1	2	2	2	2	2	2	2	3	3
36	2	2	2	2	2	2	2	3	3	3
37	2	2	2	2	2	2	3	3	3	3
38	2	2	2	2	2	3	3	3	3	4
39	2	2	2	2	3	3	3	3	4	4
40	2	2	3	3	3	3	3	4	4	4
41	2	3	3	3	3	3	4	4	4	5
42	3	3	3	3	3	4	4	4	5	5
43	3	3	3	4	4	4	4	5	5	6
44	3	3	4	4	4	4	5	5	6	6
45	3	4	4	4	5	5	5	6	6	7
46	4	4	4	4	5	5	6	6	7	7
47	4	4	5	5	5	6	6	7	7	8
48	4	5	5	5	6	6	7	7	8	9
49	5	5	5	6	6	7	8	8	9	10
50	5	5	6	6	7	8	8	9	10	10
51	5	6	6	7	8	8	9	10	11	11
52	6	7	7	8	8	9	10	11	11	12
53	7	7	8	8	9	10	11	12	13	14
54	7	8	8	9	10	11	12	13	14	15

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT—Continued

Age	Years—									
	21	22	23	24	25	26	27	28	29	30
55	8	9	9	10	11	12	13	14	15	16
56	9	9	10	11	12	13	14	15	16	18
57	9	10	11	12	13	14	15	17	18	19
58	10	11	12	13	14	16	17	18	19	21
59	11	12	13	15	16	17	18	20	21	22
60	12	14	15	16	17	19	20	21	23	24
61	14	15	16	17	19	20	22	23	25	26
62	15	16	18	19	20	22	23	25	27	28
63	16	18	19	21	22	24	25	27	29	30
64	18	19	21	23	24	26	28	29	31	33
65	20	21	23	25	26	28	30	31	33	35
66	21	23	25	27	28	30	32	34	35	37
67	23	25	27	29	31	32	34	36	38	40
68	25	27	29	31	33	35	37	38	40	42
69	28	29	31	33	35	37	39	41	43	44
70	30	32	34	36	38	40	42	43	45	47
71	32	34	36	38	40	42	44	46	47	49
72	35	37	39	41	43	45	46	48	50	51
73	37	39	41	43	45	47	49	51	52	54
74	40	42	44	46	48	50	51	53	54	56
75	42	44	46	48	50	52	54	55	57	58
76	45	47	49	51	53	54	56	58	59	60
77	47	50	51	53	55	57	58	60	61	62
78	50	52	54	56	57	59	61	62	63	64
79	53	55	56	58	60	61	63	64	65	66
80	55	57	59	60	62	63	65	66	67	68
81	58	59	61	63	64	66	67	68	69	70
82	60	62	63	65	66	68	69	70	71	72
83	62	64	66	67	68	70	71	72	73	74
84	65	66	68	69	70	71	72	73	74	75
85	67	68	70	71	72	73	74	75	76	77
86	69	70	72	73	74	75	76	77	78	79
87	71	72	73	75	76	77	78	79	80	81
88	73	74	75	76	77	79	80	81	82	83
89	74	76	77	78	79	80	81	82	83	84
90	76	77	78	79	80	81	82	83	84	85
91	78	79	80	81	82	83	84	85	86	87
92	79	80	81	82	83	84	85	86	87	88
93	80	81	82	83	84	85	86	87	88	89
94	81	82	83	84	85	86	87	88	89	90
95	82	83	84	85	86	87	88	89	90	91
96	83	84	85	86	87	88	89	90	91	92
97	84	85	86	87	88	89	90	91	92	93
98	85	86	87	88	89	90	91	92	93	94
99	86	87	88	89	90	91	92	93	94	95
100	87	88	89	90	91	92	93	94	95	96
101	88	89	90	91	92	93	94	95	96	97
102	89	90	91	92	93	94	95	96	97	98
103	90	91	92	93	94	95	96	97	98	99
104	91	92	93	94	95	96	97	98	99	100
105	92	93	94	95	96	97	98	99	100	101
106	93	94	95	96	97	98	99	100	101	102
107	94	95	96	97	98	99	100	101	102	103
108	95	96	97	98	99	100	101	102	103	104
109	96	97	98	99	100	101	102	103	104	105
110	97	98	99	100	101	102	103	104	105	106
111	98	99	100	101	102	103	104	105	106	107
112	99	100	101	102	103	104	105	106	107	108
113	100	101	102	103	104	105	106	107	108	109
114	101	102	103	104	105	106	107	108	109	110
115	102	103	104	105	106	107	108	109	110	111

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT

Age	Years—									
	31	32	33	34	35	36	37	38	39	40
5	0	1	1	1	1	1	1	1	1	1
6	0	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1
17	1	1	1	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	2	2
21	1	1	1	1	1	1	1	2	2	2
22	1	1	1	1	1	1	2	2	2	2
23	1	1	1	1	1	2	2	2	2	2
24	1	1	2	2	2	2	2	2	2	2

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT—Continued

Age	Years—									
	31	32	33	34	35	36	37	38	39	40
25	1	2	2	2	2	2	2	2	2	3
26	2	2	2	2	2	2	2	2	3	3
27	2	2	2	2	2	2	2	3	3	3
28	2	2	2	2	2	3	3	3	3	4
29	2	2	2	3	3	3	3	3	4	4
30	2	2	2	3	3	3	3	4	4	4
31	2	2	3	3	3	3	4	4	4	5
32	2	3	3	3	3	4	4	4	5	5
33	3	3	3	3	3	4	4	4	5	5
34	3	3	3	4	4	4	4	5	5	6
35	3	3	3	4	4	4	5	5	5	6
36	3	4	4	4	4	5	5	6	6	7
37	4	4	4	4	5	5	6	6	7	8
38	4	4	5	5	5	6	6	7	8	9
39	4	5	5	5	6	6	7	7	8	9
40	5	5	5	6	6	7	7	8	9	10
41	5	5	6	6	7	7	8	9	10	11
42	6	6	6	7	7	8	9	10	11	12
43	6	7	7	8	8	9	10	11	12	13
44	7	7	8	8	9	10	11	12	13	14
45	7	8	8	9	10	11	12	13	14	15
46	8	9	9	10	11	12	13	14	15	16
47	9	9	10	11	12	13	14	15	16	17
48	9	10	11	12	13	14	15	16	17	18
49	10	11	12	13	14	15	16	17	18	19
50	11	12	13	14	15	16	17	18	19	20
51	12	13	14	15	16	17	19	20	21	22
52	13	14	15	17	18	19	20	22	23	24
53	15	16	17	18	19	20	22	23	24	26
54	16	17	18	19	21	22	23	25	26	28
55	17	18	20	21	22	24	25	27	28	30
56	19	20	21	23	24	26	27	29	30	32
57	20	22	23	25	26	28	29	31	32	34
58	22	24	25	27	28	30	31	33	34	36
59	24	25	27	28	30	32	33	35	36	38
60	26	27	29	31	32	34	35	37	38	40
61	28	29	31	33	34	36	37	39	40	42
62	30	32	33	35	36	38	40	41	42	44
63	32	34	35	37	39	40	42	43	45	46
64	34	36	38	39	41	42	44	45	47	48
65	37	38	40	42	43	45	46	47	49	50
66	39	41	42	44	45	47	48	50	51	52
67	41	43	45	46	48	49	50	52	53	54
68	44	45	47	48	50	51	52	54	55	56
69	46	48	49	51	52	53	54	56	57	58
70	48	50	51	53	54	55	57	58	59	60
71	51	52	54	55	56	57	59	60	62	63
72	53	54	56	57	58	59	60	62	63	64
73	55	57	58	59	60	61	62	63	64	65
74	57	59	60	61	62	63	64	65	66	67
75	59	61	62	63	64	65	66	67	68	69
76	62	63	64	65	66	67	68	69	70	71
77	64	65	66	67	68	69	70	71	72	73
78	66	67	68	69	70	71	72	73	74	75
79	67	68	69	70	71	72	73	74	75	76
80	69	70	71	72	73	74	75	76	77	78
81	71	72	73	74	75	76	77	78	79	80
82	73	74	75	76	77	78	79	80	81	82
83	74	75	76	77	78	79	80	81	82	83
84	76	77	78	79	80	81	82	83	84	85
85	78	79	80	81	82	83	84	85	86	87
86	79	80	81	82	83	84	85	86	87	88
87	80	81	82	83	84	85	86	87	88	89
88	82	83	84	85	86	87	88	89	90	91
89	83	84	85	86	87	88	89	90	91	92
90	84	85	86	87	88	89	90	91	92	93
91	85	86	87	88	89	90	91	92	93	94
92	86	87	88	89	90	91	92	93	94	95
93	87	88	89	90	91	92	93	94	95	96
94	88	89	90	91	92	93	94	95	96	97
95	89	90	91	92	93	94	95	96	97	98
96	89	90	91	92	93	94	95	96	97	98
97	90	91	92	93	94	95	96	97	98	99
98	91	92	93	94	95	96	97	98	99	
99	91	92	93	94	95	96	97	98	99	
100	92	93	94	95	96	97	98	99		
101	92	93	94	95	96	97	98	99		
102	93	94	95	96	97	98	99			
103	93	94	95	96	97	98	99			
104	94	95	96	97	98	99				
105	94	95	96	97	98	99				
106	95	96	97	98	99					
107	95	96	97	98	99					
108	96	97	98	99						
109	96	97	98	99						
110	97	98	99							
111	97	98	99							
112	97	98	99							
113	98	99								
114	98	99								

TABLE VII.—PERCENT VALUE OF REFUND FEATURE; DURATION OF GUARANTEED AMOUNT—Continued

Age	Years—									
	31	32	33	34	35	36	37	38	39	40
115.....	98	98	98	99	99	99	99	99	99	99

TABLE VIII.—TEMPORARY LIFE ANNUITIES; ¹ ONE LIFE—EXPECTED RETURN MULTIPLES

[See footnote at end of tables]

Temporary Period—Maximum Duration of Annuity

Age	Years—									
	1	2	3	4	5	6	7	8	9	10
5.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
6.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
7.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
8.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
9.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
10.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
11.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
12.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
13.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
14.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
15.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
16.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
17.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
18.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
19.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
20.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
21.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
22.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
23.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
24.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
25.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
26.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
27.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
28.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
29.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
30.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
31.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
32.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
33.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
34.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
35.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
36.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
37.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.9
38.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.9
39.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.9
40.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.9
41.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	8.9	9.9
42.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	8.9	9.9
43.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	7.9	8.9	9.9
44.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	7.9	8.9	9.9
45.....	1.0	2.0	3.0	4.0	5.0	6.0	7.0	7.9	8.9	9.9
46.....	1.0	2.0	3.0	4.0	5.0	6.0	6.9	7.9	8.9	9.9
47.....	1.0	2.0	3.0	4.0	5.0	6.0	6.9	7.9	8.9	9.9
48.....	1.0	2.0	3.0	4.0	5.0	6.0	6.9	7.9	8.9	9.9
49.....	1.0	2.0	3.0	4.0	5.0	6.0	6.9	7.9	8.9	9.9
50.....	1.0	2.0	3.0	4.0	5.0	6.0	6.9	7.9	8.9	9.8
51.....	1.0	2.0	3.0	4.0	5.0	5.9	6.9	7.9	8.9	9.8
52.....	1.0	2.0	3.0	4.0	5.0	5.9	6.9	7.9	8.8	9.8
53.....	1.0	2.0	3.0	4.0	5.0	5.9	6.9	7.9	8.8	9.8
54.....	1.0	2.0	3.0	4.0	4.9	5.9	6.9	7.9	8.8	9.8
55.....	1.0	2.0	3.0	4.0	4.9	5.9	6.9	7.8	8.8	9.7
56.....	1.0	2.0	3.0	4.0	4.9	5.9	6.9	7.8	8.8	9.7
57.....	1.0	2.0	3.0	4.0	4.9	5.9	6.9	7.8	8.8	9.7
58.....	1.0	2.0	3.0	4.0	4.9	5.9	6.9	7.8	8.7	9.7
59.....	1.0	2.0	3.0	4.0	4.9	5.9	6.8	7.8	8.7	9.6
60.....	1.0	2.0	3.0	3.9	4.9	5.9	6.8	7.8	8.7	9.6
61.....	1.0	2.0	3.0	3.9	4.9	5.9	6.8	7.7	8.7	9.6
62.....	1.0	2.0	3.0	3.9	4.9	5.8	6.8	7.7	8.6	9.5
63.....	1.0	2.0	3.0	3.9	4.9	5.8	6.8	7.7	8.6	9.5
64.....	1.0	2.0	3.0	3.9	4.9	5.8	6.7	7.6	8.5	9.4
65.....	1.0	2.0	3.0	3.9	4.9	5.8	6.7	7.6	8.5	9.3
66.....	1.0	2.0	2.9	3.9	4.8	5.8	6.7	7.6	8.4	9.3
67.....	1.0	2.0	2.9	3.9	4.8	5.7	6.6	7.5	8.4	9.2
68.....	1.0	2.0	2.9	3.9	4.8	5.7	6.6	7.5	8.3	9.1
69.....	1.0	2.0	2.9	3.9	4.8	5.7	6.6	7.4	8.2	9.0
70.....	1.0	2.0	2.9	3.9	4.8	5.6	6.5	7.3	8.1	8.9
71.....	1.0	2.0	2.9	3.8	4.7	5.6	6.5	7.3	8.1	8.8
72.....	1.0	2.0	2.9	3.8	4.7	5.6	6.4	7.2	8.0	8.7
73.....	1.0	2.0	2.9	3.8	4.7	5.5	6.3	7.1	7.9	8.6
74.....	1.0	1.9	2.9	3.8	4.6	5.5	6.3	7.0	7.7	8.4
75.....	1.0	1.9	2.9	3.8	4.6	5.4	6.2	6.9	7.6	8.3
76.....	1.0	1.9	2.8	3.7	4.6	5.4	6.1	6.8	7.5	8.1
77.....	1.0	1.9	2.8	3.7	4.5	5.3	6.0	6.7	7.3	7.9
78.....	1.0	1.9	2.8	3.7	4.5	5.2	5.9	6.6	7.2	7.7
79.....	1.0	1.9	2.8	3.6	4.4	5.1	5.8	6.4	7.0	7.5
80.....	1.0	1.9	2.8	3.6	4.4	5.1	5.7	6.3	6.8	7.3
81.....	1.0	1.9	2.8	3.6	4.3	5.0	5.6	6.1	6.6	7.0

TABLE VIII.—TEMPORARY LIFE ANNUITIES;¹ ONE LIFE—EXPECTED RETURN MULTIPLES—Continued

[See footnote at end of tables]

Temporary Period—Maximum Duration of Annuity

Age	Years—									
	1	2	3	4	5	6	7	8	9	10
82	1.0	1.9	2.7	3.5	4.2	4.9	5.4	6.0	6.4	6.8
83	1.0	1.9	2.7	3.5	4.1	4.8	5.3	5.8	6.2	6.5
84	1.0	1.8	2.7	3.4	4.1	4.6	5.2	5.6	6.0	6.3
85	1.0	1.8	2.6	3.3	4.0	4.5	5.0	5.4	5.7	6.0
86	1.0	1.8	2.6	3.3	3.9	4.4	4.8	5.2	5.5	5.7
87	.9	1.8	2.5	3.2	3.8	4.3	4.7	5.0	5.3	5.5
88	.9	1.8	2.5	3.1	3.7	4.1	4.5	4.8	5.0	5.2
89	.9	1.8	2.5	3.1	3.6	4.0	4.3	4.6	4.8	4.9
90	.9	1.7	2.4	3.0	3.4	3.8	4.1	4.4	4.5	4.7
91	.9	1.7	2.4	2.9	3.3	3.7	4.0	4.2	4.3	4.4
92	.9	1.7	2.3	2.8	3.2	3.5	3.8	4.0	4.1	4.2
93	.9	1.7	2.3	2.7	3.1	3.4	3.6	3.8	3.9	4.0
94	.9	1.6	2.2	2.7	3.0	3.3	3.5	3.6	3.7	3.8
95	.9	1.6	2.2	2.6	2.9	3.1	3.3	3.4	3.5	3.6
96	.9	1.6	2.1	2.5	2.8	3.0	3.2	3.3	3.3	3.4
97	.9	1.6	2.1	2.4	2.7	2.9	3.0	3.1	3.2	3.2
98	.9	1.5	2.0	2.4	2.6	2.8	2.9	3.0	3.0	3.0
99	.9	1.5	2.0	2.3	2.5	2.6	2.7	2.8	2.8	2.8
100	.9	1.5	1.9	2.2	2.4	2.5	2.6	2.6	2.6	2.7
101	.8	1.4	1.8	2.1	2.3	2.4	2.4	2.5	2.5	2.5
102	.8	1.4	1.8	2.0	2.1	2.2	2.3	2.3	2.3	2.3
103	.8	1.4	1.7	1.9	2.0	2.1	2.1	2.1	2.1	2.1
104	.8	1.3	1.6	1.8	1.9	1.9	1.9	1.9	1.9	1.9
105	.8	1.3	1.5	1.7	1.7	1.8	1.8	1.8	1.8	1.8
106	.8	1.2	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.6
107	.7	1.1	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4
108	.7	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3
109	.7	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
110	.7	.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
111	.6	.8	.9	.9	.9	.9	.9	.9	.9	.9
112	.6	.7	.8	.8	.8	.8	.8	.8	.8	.8
113	.6	.6	.7	.7	.7	.7	.7	.7	.7	.7
114	.5	.6	.6	.6	.6	.6	.6	.6	.6	.6
115	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5

TABLE VIII.—TEMPORARY LIFE ANNUITIES;¹ ONE LIFE—EXPECTED RETURN MULTIPLES

[See footnote at end of tables]

Temporary Period—Maximum Duration of Annuity

Age	Years—									
	11	12	13	14	15	16	17	18	19	20
5	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	19.9
6	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	19.9
7	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	19.9
8	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	18.9	19.9
9	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	18.9	19.9
10	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	18.9	19.9
11	11.0	12.0	13.0	14.0	15.0	16.0	17.0	17.9	18.9	19.9
12	11.0	12.0	13.0	14.0	15.0	16.0	17.0	17.9	18.9	19.9
13	11.0	12.0	13.0	14.0	15.0	16.0	17.0	17.9	18.9	19.9
14	11.0	12.0	13.0	14.0	15.0	16.0	16.9	17.9	18.9	19.9
15	11.0	12.0	13.0	14.0	15.0	16.0	16.9	17.9	18.9	19.9
16	11.0	12.0	13.0	14.0	15.0	16.0	16.9	17.9	18.9	19.9
17	11.0	12.0	13.0	14.0	15.0	15.9	16.9	17.9	18.9	19.9
18	11.0	12.0	13.0	14.0	15.0	15.9	16.9	17.9	18.9	19.9
19	11.0	12.0	13.0	14.0	15.0	15.9	16.9	17.9	18.9	19.9
20	11.0	12.0	13.0	14.0	14.9	15.9	16.9	17.9	18.9	19.9
21	11.0	12.0	13.0	14.0	14.9	15.9	16.9	17.9	18.9	19.9
22	11.0	12.0	13.0	14.0	14.9	15.9	16.9	17.9	18.9	19.9
23	11.0	12.0	13.0	13.9	14.9	15.9	16.9	17.9	18.9	19.9
24	11.0	12.0	13.0	13.9	14.9	15.9	16.9	17.9	18.9	19.9
25	11.0	12.0	13.0	13.9	14.9	15.9	16.9	17.9	18.9	19.9
26	11.0	12.0	12.9	13.9	14.9	15.9	16.9	17.9	18.9	19.9
27	11.0	12.0	12.9	13.9	14.9	15.9	16.9	17.9	18.9	19.9
28	11.0	12.0	12.9	13.9	14.9	15.9	16.9	17.9	18.9	19.9
29	11.0	12.0	12.9	13.9	14.9	15.9	16.9	17.9	18.9	19.9
30	11.0	11.9	12.9	13.9	14.9	15.9	16.9	17.9	18.8	19.8
31	11.0	11.9	12.9	13.9	14.9	15.9	16.9	17.9	18.8	19.8
32	11.0	11.9	12.9	13.9	14.9	15.9	16.9	17.8	18.8	19.8
33	11.0	11.9	12.9	13.9	14.9	15.9	16.8	17.8	18.8	19.8
34	10.9	11.9	12.9	13.9	14.9	15.9	16.8	17.8	18.8	19.7
35	10.9	11.9	12.9	13.9	14.9	15.8	16.8	17.8	18.8	19.7
36	10.9	11.9	12.9	13.9	14.9	15.8	16.8	17.8	18.7	19.7
37	10.9	11.9	12.9	13.9	14.8	15.8	16.8	17.8	18.7	19.7
38	10.9	11.9	12.9	13.9	14.8	15.8	16.8	17.7	18.7	19.6
39	10.9	11.9	12.9	13.9	14.8	15.8	16.8	17.7	18.6	19.6
40	10.9	11.9	12.9	13.8	14.8	15.8	16.7	17.7	18.6	19.5
41	10.9	11.9	12.8	13.8	14.8	15.7	16.7	17.6	18.6	19.5
42	10.9	11.9	12.8	13.8	14.8	15.7	16.7	17.6	18.6	19.5
43	10.9	11.8	12.8	13.8	14.7	15.7	16.6	17.6	18.5	19.4
44	10.9	11.8	12.8	13.8	14.7	15.7	16.6	17.5	18.5	19.4
45	10.9	11.8	12.8	13.8	14.7	15.7	16.6	17.5	18.5	19.4

TABLE VIII.—TEMPORARY LIFE ANNUITIES;¹ ONE LIFE—EXPECTED RETURN MULTIPLES—Continued

[See footnote at end of tables]

Temporary Period—Maximum Duration of Annuity

Age	Years—									
	11	12	13	14	15	16	17	18	19	20
46	10.9	11.8	12.8	13.7	14.7	15.6	16.6	17.5	18.4	19.3
47	10.8	11.8	12.8	13.7	14.7	15.6	16.5	17.5	18.4	19.3
48	10.8	11.8	12.7	13.7	14.6	15.6	16.5	17.4	18.3	19.2
49	10.8	11.8	12.7	13.7	14.6	15.5	16.4	17.4	18.3	19.2
50	10.8	11.7	12.7	13.6	14.6	15.5	16.4	17.3	18.2	19.1
51	10.8	11.7	12.7	13.6	14.5	15.4	16.3	17.2	18.1	19.0
52	10.8	11.7	12.6	13.6	14.5	15.4	16.3	17.2	18.0	18.9
53	10.7	11.7	12.6	13.5	14.4	15.3	16.2	17.1	18.0	18.8
54	10.7	11.6	12.6	13.5	14.4	15.3	16.2	17.0	17.9	18.7
55	10.7	11.6	12.5	13.4	14.3	15.2	16.1	16.9	17.8	18.6
56	10.7	11.6	12.5	13.4	14.3	15.1	16.0	16.8	17.6	18.4
57	10.6	11.5	12.4	13.3	14.2	15.1	15.9	16.7	17.5	18.3
58	10.6	11.5	12.4	13.3	14.1	15.0	15.8	16.6	17.4	18.1
59	10.6	11.4	12.3	13.2	14.0	14.9	15.7	16.4	17.2	17.9
60	10.5	11.4	12.3	13.1	13.9	14.7	15.5	16.3	17.0	17.7
61	10.5	11.3	12.2	13.0	13.8	14.6	15.4	16.1	16.8	17.5
62	10.4	11.3	12.1	12.9	13.7	14.5	15.2	15.9	16.6	17.2
63	10.3	11.2	12.0	12.8	13.6	14.3	15.0	15.7	16.3	17.0
64	10.3	11.1	11.9	12.7	13.4	14.1	14.8	15.5	16.1	16.7
65	10.2	11.0	11.8	12.5	13.2	13.9	14.6	15.2	15.8	16.3
66	10.1	10.9	11.6	12.4	13.1	13.7	14.4	14.9	15.5	16.0
67	10.0	10.8	11.5	12.2	12.9	13.5	14.1	14.7	15.2	15.6
68	9.9	10.6	11.4	12.0	12.7	13.3	13.8	14.3	14.8	15.3
69	9.8	10.5	11.2	11.8	12.4	13.0	13.5	14.0	14.4	14.8
70	9.6	10.3	11.0	11.6	12.2	12.7	13.2	13.7	14.0	14.4
71	9.5	10.2	10.8	11.4	11.9	12.4	12.9	13.3	13.6	13.9
72	9.4	10.0	10.6	11.2	11.7	12.1	12.5	12.9	13.2	13.5
73	9.2	9.8	10.4	10.9	11.4	11.8	12.1	12.5	12.7	13.0
74	9.0	9.6	10.1	10.6	11.0	11.4	11.7	12.0	12.3	12.5
75	8.8	9.4	9.9	10.3	10.7	11.0	11.3	11.6	11.8	12.0
76	8.6	9.1	9.6	10.0	10.3	10.6	10.9	11.1	11.3	11.4
77	8.4	8.9	9.3	9.7	10.0	10.2	10.5	10.6	10.8	10.9
78	8.2	8.6	9.0	9.3	9.6	9.8	10.0	10.2	10.3	10.4
79	7.9	8.3	8.7	9.0	9.2	9.4	9.5	9.7	9.8	9.8
80	7.7	8.0	8.3	8.6	8.8	9.0	9.1	9.2	9.3	9.3
81	7.4	7.7	8.0	8.2	8.4	8.5	8.6	8.7	8.8	8.8
82	7.1	7.4	7.6	7.8	8.0	8.1	8.2	8.2	8.3	8.3
83	6.8	7.1	7.3	7.4	7.5	7.6	7.7	7.8	7.8	7.8
84	6.5	6.7	6.9	7.0	7.1	7.2	7.3	7.3	7.3	7.4
85	6.2	6.4	6.6	6.7	6.7	6.8	6.8	6.9	6.9	6.9
86	5.9	6.1	6.2	6.3	6.4	6.4	6.4	6.5	6.5	6.5
87	5.6	5.8	5.9	5.9	6.0	6.0	6.0	6.1	6.1	6.1
88	5.3	5.4	5.5	5.6	5.6	5.6	5.7	5.7	5.7	5.7
89	5.1	5.1	5.2	5.3	5.3	5.3	5.3	5.3	5.3	5.3
90	4.8	4.9	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.0
91	4.5	4.6	4.6	4.6	4.7	4.7	4.7	4.7	4.7	4.7
92	4.3	4.3	4.3	4.4	4.4	4.4	4.4	4.4	4.4	4.4
93	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
94	3.8	3.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
95	3.6	3.6	3.6	3.6	3.7	3.7	3.7	3.7	3.7	3.7
96	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
97	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
98	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
99	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
100	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
101	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
102	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
103	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
104	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
105	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
106	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
107	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
108	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
109	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
110	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
111	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
112	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8
113	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
114	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6
115	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5

TABLE VIII.—TEMPORARY LIFE ANNUITIES;¹ ONE LIFE—EXPECTED RETURN MULTIPLES

[See footnote at end of tables]

Temporary Period—Maximum Duration of Annuity

Age	Years—									
	21	22	23	24	25	26	27	28	29	30
5	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.9	29.9
6	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.9	29.9
7	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.9	29.9
8	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.9	29.8
9	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.9	29.8

TABLE VIII.—TEMPORARY LIFE ANNUITIES; ¹ ONE LIFE—EXPECTED RETURN MULTIPLES—Continued

[See footnote at end of tables]

Temporary Period—Maximum Duration of Annuity

Age	Years—									
	21	22	23	24	25	26	27	28	29	30
10	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.8	29.8
11	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.8	29.8
12	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.8	28.8	29.8
13	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.8	28.8	29.8
14	20.9	21.9	22.9	23.9	24.9	25.9	26.8	27.8	28.8	29.8
15	20.9	21.9	22.9	23.9	24.9	25.9	26.8	27.8	28.8	29.8
16	20.9	21.9	22.9	23.9	24.9	25.8	26.8	27.8	28.8	29.8
17	20.9	21.9	22.9	23.9	24.9	25.8	26.8	27.8	28.8	29.8
18	20.9	21.9	22.9	23.9	24.8	25.8	26.8	27.8	28.8	29.7
19	20.9	21.9	22.9	23.9	24.8	25.8	26.8	27.8	28.8	29.7
20	20.9	21.9	22.9	23.8	24.8	25.8	26.8	27.8	28.7	29.7
21	20.9	21.9	22.9	23.8	24.8	25.8	26.8	27.8	28.7	29.7
22	20.9	21.9	22.8	23.8	24.8	25.8	26.8	27.7	28.7	29.7
23	20.9	21.9	22.8	23.8	24.8	25.8	26.7	27.7	28.7	29.7
24	20.9	21.8	22.8	23.8	24.8	25.8	26.7	27.7	28.7	29.6
25	20.9	21.8	22.8	23.8	24.8	25.7	26.7	27.7	28.6	29.6
26	20.8	21.8	22.8	23.8	24.8	25.7	26.7	27.7	28.6	29.6
27	20.8	21.8	22.8	23.8	24.7	25.7	26.7	27.6	28.6	29.5
28	20.8	21.8	22.8	23.7	24.7	25.7	26.6	27.6	28.6	29.5
29	20.8	21.8	22.8	23.7	24.7	25.7	26.6	27.6	28.5	29.5
30	20.8	21.8	22.7	23.7	24.7	25.6	26.6	27.5	28.5	29.4
31	20.8	21.8	22.7	23.7	24.6	25.6	26.6	27.5	28.4	29.4
32	20.8	21.7	22.7	23.7	24.6	25.6	26.5	27.5	28.4	29.3
33	20.8	21.7	22.7	23.6	24.6	25.5	26.5	27.4	28.4	29.3
34	20.7	21.7	22.7	23.6	24.6	25.5	26.4	27.4	28.3	29.2
35	20.7	21.7	22.6	23.6	24.5	25.5	26.4	27.3	28.2	29.1
36	20.7	21.6	22.6	23.5	24.5	25.4	26.3	27.2	28.1	29.0
37	20.7	21.6	22.6	23.5	24.4	25.4	26.3	27.1	28.0	28.9
38	20.6	21.6	22.5	23.4	24.4	25.3	26.2	27.0	27.9	28.8
39	20.6	21.5	22.5	23.4	24.3	25.2	26.1	27.0	27.8	28.7
40	20.6	21.5	22.4	23.3	24.3	25.2	26.1	27.0	27.7	28.6
41	20.5	21.4	22.4	23.3	24.2	25.1	26.0	26.9	27.7	28.6
42	20.5	21.4	22.3	23.2	24.1	25.0	25.9	26.8	27.6	28.5
43	20.4	21.3	22.2	23.2	24.0	24.9	25.8	26.6	27.5	28.3
44	20.4	21.3	22.2	23.1	24.0	24.8	25.7	26.5	27.3	28.2
45	20.3	21.2	22.1	23.0	23.9	24.7	25.6	26.4	27.2	28.0
46	20.2	21.1	22.0	22.9	23.8	24.6	25.4	26.2	27.0	27.8
47	20.2	21.1	21.9	22.8	23.6	24.5	25.3	26.1	26.8	27.6
48	20.1	21.0	21.8	22.7	23.5	24.3	25.1	25.9	26.6	27.4

TABLE VIII.—TEMPORARY LIFE ANNUITIES; ¹ ONE LIFE—EXPECTED RETURN MULTIPLES—Continued

[See footnote at end of tables]

Temporary Period—Maximum Duration of Annuity

Age	Years—									
	21	22	23	24	25	26	27	28	29	30
97	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
98	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
99	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
100	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
101	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
102	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
103	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
104	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
105	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
106	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
107	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
108	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
109	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
110	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
111	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
112	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8
113	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
114	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6
115	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5

TABLE VIII.—TEMPORARY LIFE ANNUITIES; ¹ ONE LIFE—EXPECTED RETURN MULTIPLES

[See footnote at end of tables]

Temporary Period—Maximum Duration of Annuity

Age	Years—									
	31	32	33	34	35	36	37	38	39	40
5	30.8	31.8	32.8	33.8	34.8	35.8	36.8	37.7	38.7	39.7
6	30.8	31.8	32.8	33.8	34.8	35.8	36.8	37.7	38.7	39.7
7	30.8	31.8	32.8	33.8	34.8	35.8	36.7	37.7	38.7	39.7
8	30.8	31.8	32.8	33.8	34.8	35.7	36.7	37.7	38.7	39.7
9	30.8	31.8	32.8	33.8	34.8	35.7	36.7	37.7	38.7	39.7
10	30.8	31.8	32.8	33.8	34.7	35.7	36.7	37.7	38.6	39.6
11	30.8	31.8	32.8	33.8	34.7	35.7	36.7	37.7	38.6	39.6
12	30.8	31.8	32.8	33.7	34.7	35.7	36.7	37.6	38.6	39.6
13	30.8	31.8	32.7	33.7	34.7	35.7	36.6	37.6	38.6	39.5
14	30.8	31.8	32.7	33.7	34.7	35.7	36.6	37.6	38.6	39.5
15	30.8	31.7	32.7	33.7	34.7	35.6	36.6	37.6	38.5	39.5
16	30.8	31.7	32.7	33.7	34.6	35.6	36.6	37.5	38.5	39.4
17	30.7	31.7	32.7	33.7	34.6	35.6	36.6	37.5	38.5	39.4
18	30.7	31.7	32.7	33.6	34.6	35.6	36.5	37.5	38.4	39.4
19	30.7	31.7	32.6	33.6	34.6	35.5	36.5	37.4	38.4	39.3
20	30.7	31.7	32.6	33.6	34.5	35.5	36.4	37.4	38.3	39.3
21	30.7	31.6	32.6	33.6	34.5	35.5	36.4	37.4	38.3	39.2
22	30.6	31.6	32.6	33.5	34.5	35.4	36.4	37.3	38.2	39.2
23	30.6	31.6	32.5	33.5	34.4	35.4	36.3	37.3	38.2	39.1
24	30.6	31.5	32.5	33.4	34.4	35.3	36.3	37.2	38.1	39.0
25	30.6	31.5	32.5	33.4	34.3	35.3	36.2	37.1	38.1	39.0
26	30.5	31.5	32.4	33.4	34.3	35.2	36.2	37.1	38.0	38.9
27	30.5	31.4	32.4	33.3	34.2	35.2	36.1	37.0	37.9	38.8
28	30.5	31.4	32.3	33.3	34.2	35.1	36.0	36.9	37.8	38.7
29	30.4	31.4	32.3	33.2	34.1	35.0	35.9	36.8	37.7	38.6
30	30.4	31.3	32.2	33.1	34.1	35.0	35.8	36.7	37.6	38.5
31	30.3	31.2	32.2	33.1	34.0	34.9	35.8	36.6	37.5	38.3
32	30.3	31.2	32.1	33.0	33.9	34.8	35.6	36.5	37.4	38.2
33	30.2	31.1	32.0	32.9	33.8	34.7	35.5	36.4	37.2	38.0
34	30.1	31.0	31.9	32.8	33.7	34.6	35.4	36.2	37.1	37.9
35	30.1	31.0	31.8	32.7	33.6	34.4	35.3	36.1	36.9	37.7
36	30.0	30.9	31.7	32.6	33.5	34.3	35.1	35.9	36.7	37.4
37	29.9	30.8	31.6	32.5	33.3	34.1	34.9	35.7	36.5	37.2
38	29.8	30.7	31.5	32.3	33.2	34.0	34.7	35.5	36.2	37.0
39	29.7	30.5	31.4	32.2	33.0	33.8	34.5	35.3	36.0	36.7
40	29.6	30.4	31.2	32.0	32.8	33.6	34.3	35.0	35.7	36.4
41	29.4	30.2	31.0	31.8	32.6	33.3	34.1	34.7	35.4	36.0
42	29.3	30.1	30.9	31.6	32.4	33.1	33.8	34.4	35.1	35.7
43	29.1	29.9	30.7	31.4	32.1	32.8	33.5	34.1	34.7	35.3
44	28.9	29.7	30.5	31.2	31.9	32.5	33.2	33.8	34.3	34.9
45	28.8	29.5	30.2	30.9	31.6	32.2	32.8	33.4	33.9	34.4
46	28.5	29.3	30.0	30.6	31.3	31.9	32.4	33.0	33.5	33.9
47	28.3	29.0	29.7	30.3	30.9	31.5	32.0	32.5	33.0	33.4
48	28.1	28.7	29.4	30.0	30.6	31.1	31.6	32.1	32.5	32.9
49	27.8	28.4	29.0	29.6	30.2	30.7	31.1	31.5	31.9	32.3
50	27.5	28.1	28.7	29.2	29.7	30.2	30.6	31.0	31.4	31.7
51	27.2	27.8	28.3	28.8	29.3	29.7	30.1	30.4	30.7	31.0
52	26.8	27.4	27.9	28.4	28.8	29.2	29.5	29.8	30.1	30.3
53	26.5	27.0	27.4	27.9	28.3	28.6	28.9	29.2	29.4	29.6
54	26.1	26.5	27.0	27.4	27.7	28.0	28.3	28.5	28.7	28.9
55	25.8	26.1	26.5	26.8	27.1	27.4	27.6	27.8	28.0	28.1
56	25.2	25.6	25.9	26.2	26.5	26.7	26.9	27.1	27.2	27.3
57	24.7	25.0	25.3	25.6	25.8	26.0	26.2	26.3	26.5	26.5
58	24.1	24.4	24.7	25.0	25.2	25.3	25.5	25.6	25.7	25.7
59	23.6	23.8	24.1	24.3	24.4	24.6	24.7	24.8	24.9	24.9
60	23.0	23.2	23.4	23.6	23.7	23.8	23.9	24.0	24.0	24.1

TABLE VIII.—TEMPORARY LIFE ANNUITIES;¹ ONE LIFE—EXPECTED RETURN MULTIPLES—Continued

(See footnote at end of tables)

Temporary Period—Maximum Duration of Annuity

Age	Years—									
	31	32	33	34	35	36	37	38	39	40
61	22.3	22.5	22.7	22.9	23.0	23.1	23.1	23.2	23.2	23.3
62	21.7	21.9	22.0	22.1	22.2	22.3	22.3	22.4	22.4	22.4
63	21.0	21.1	21.3	21.4	21.4	21.5	21.5	21.6	21.6	21.6
64	20.3	20.4	20.5	20.6	20.6	20.7	20.7	20.7	20.8	20.8
65	19.6	19.7	19.8	19.8	19.9	19.9	19.9	19.9	19.9	20.0
66	18.9	19.0	19.1	19.1	19.1	19.1	19.1	19.1	19.1	19.1
67	18.2	18.2	18.3	18.3	18.3	18.3	18.3	18.3	18.4	18.4
68	17.4	17.5	17.5	17.5	17.5	17.6	17.6	17.6	17.6	17.6
69	16.7	16.7	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
70	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
71	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
72	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6
73	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
74	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
75	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
76	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
77	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
78	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
79	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
80	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
81	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
82	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
83	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
84	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
85	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
86	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
87	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
88	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
89	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
90	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
91	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
92	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
93	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
94	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
95	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
96	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
97	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
98	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
99	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
100	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
101	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
102	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
103	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
104	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
105	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
106	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
107	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
108	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
109	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
110	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
111	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9
112	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8
113	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
114	.6	.6	.6	.6	.6	.6	.6	.6	.6	.6
115	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5

¹ The multiples in this table are not applicable to annuities for a term certain; for such cases see paragraph (c) of § 1.72-5.

If (a) the terms of the contract involve a life or lives, and are such that the above tables cannot be correctly applied, and (b) the amounts received under the contract are at least partly "amounts received as an annuity" under a contract to which section 72 applies, the taxpayer may submit with his return an actuarial computation based upon the applicable annuity table (described below) with ages set back one year, showing the appropriate factors applied in his case, subject to the approval of the Commissioner upon examination of such return. The applicable annuity table is the 1937 Standard Annuity Table (if the investment in the contract does not include a post-June 1986 investment in the contract) or the gender-neutral

version of the 1983 Basic Table (if the investment in the contract includes a post-June 1986 investment in the contract). In the case of a contract to which § 1.72-6(d) (relating to contracts in which amounts were invested both before July 1, 1986, and after June 30, 1986) applies, the actuarial computation shall be based on both tables in accordance with the principles of § 1.72-6(d). Computations involving factors to compensate for the effects of contingencies other than mortality, such as marriage or remarriage, re-employment, recovery from disability, or the like, will not be approved.

Par. 7. Section § 1.72-11 is amended by revising paragraph (c) to read as follows:

§ 1.72-11 Amounts not received as annuity payments.

(c) *Amounts received in the nature of a refund of the consideration under a contract and in full discharge of the obligation thereof.* (1) Any amount received under a contract to which section 72 applies, if it is at least in part a refund of the consideration paid, including amounts payable to a beneficiary after the death of an annuitant by reason of a provision in the contract for a life annuity with minimum period of payments certain or with a minimum amount which must be paid in any event, shall be considered an amount received in the nature of a refund of the consideration paid for such

contract. If such an amount is in full discharge of an obligation to pay a fixed amount (whether in a lump sum or otherwise) or to pay amounts for a fixed number of years (including amounts described in paragraph (b)(3)(i) of § 1.72-2), it shall be included in the gross income of the recipient only to the extent that it, when added to amounts previously received under the contract which were excludable from gross income under the law applicable at the time of receipt, exceeds the aggregate of premiums or other consideration paid. See section 72(e)(2)(A). This paragraph shall not apply if the total of the amounts to be paid in discharge of the obligation can in any event exceed the total of the annuity payments which would otherwise fully discharge the obligation. For rules to be applied in such a case, see paragraph (e) of this section.

(2) The principles of subparagraph (1) of this paragraph may be illustrated by the following examples:

Example (1). A, a male employee, retired on December 31, 1954, at the age of 60. A life annuity of \$75 per month was payable to him beginning January 31, 1955. The annuity contract guaranteed that if A did not live for at least ten years after his retirement his beneficiary, B, would receive the monthly payments for any balance of such ten-year period which remained at the date of A's death. Under section 72, A was deemed to have paid \$3,600 toward the cost of the annuity. A lived for five years after his retirement receiving a total of \$4,500 in annuity payments. After A's death, B began receiving the monthly payments of \$75 beginning with the January 31, 1960 payment. B will exclude such payments from his gross income throughout 1960, 1961, and 1962, and will exclude only \$18 of the first payment in 1963 from his gross income for that year. Thereafter, B will include the entire amount of all such payments in his gross income for the taxable year of receipt. This result is determined as follows:

A's investment in the contract (unadjusted).....	\$3,600
Multiple from Table III of § 1.72-9 for male, age 60, where duration of guaranteed amount is 10 years (percent).....	11
Subtract value of the refund feature to the nearest dollar (11 percent of \$3,600).....	396
Investment in the contract adjusted for the present value of the refund feature without discount for interest.....	3,204
Aggregate of premiums or other consideration paid.....	3,600
A's exclusion ratio (\$3,204 ÷ \$16,360 [\$900 × 18.2]) (percent).....	19.6

Subtract amount excludable during five years A received payments (19.6 percent of \$4,500 [\$900 × 5]).....	882
Remainder of aggregate of premiums or other consideration paid excludable from gross income of B under section 72(e).....	2,718

As a result of the above computation, the number of payments to B which will exhaust the remainder of consideration paid which is excludable from gross income of the recipient is 36½ (\$2,718 ÷ \$75) and B will exclude the payments from his gross income for three years, then exclude only \$18 of the first payment for the fourth year from his gross income, and thereafter include the entire amount of all payments he receives in his gross income.

Example (2). The facts are the same as in example (1), except that B, the beneficiary, elects to receive \$50 per month for his life in lieu of the payments guaranteed under the original contractual obligation. Since such amounts will be received as an annuity and may, because of the length of time B may live, exceed the amount guaranteed, they are not amounts to which this paragraph applies. See paragraph (e) of this section.

Example (3). The facts are the same as in example (1), except that B, the beneficiary, elects to receive the remaining guaranteed amount in installments which are larger or smaller than the \$75 per month provided until, under the terms of the contract, the guaranteed amount is exhausted. The rule of subparagraph (1) of this paragraph and the computation illustrated in example (1) apply to such installments since the total of such installments will not exceed the original amount guaranteed to be paid at A's death in any event.

Example (4). C pays \$12,000 for a contract providing that he is to be paid an annuity of \$1,000 per year for 15 years. His exclusion ratio is therefore 80 percent (\$12,000 ÷ \$15,000). He directs that the annuity is to be paid to D, his beneficiary, if he should die before the full 15-year period has expired. C dies after 5 years and D is paid \$1,000 in 1960. D will include \$200 (\$1,000 - \$800 [80 percent of \$1,000]) in his gross income for the taxable year in which he receives the \$1,000 since section 72(e) and this section do not apply to the annuity payments made in accordance with the provisions and during the term of the contract. D will continue with the same exclusion ratio used by C (80 percent).

Example (5). In 1954, E paid \$50,000 into a fund and was promised an annual income for life the amount of which would depend in part upon the earnings realized from the investment of the fund in accordance with an agreed formula. The contract also specified that if E should die before ten years had elapsed, his beneficiary, F, would be paid the amounts determined annually under the formula until ten payments had been received by E and F together. E died in 1960, having received five payments totaling \$30,000. Assuming that \$22,000 of this amount was properly excludable from E's gross income prior to his death, F will exclude from his gross income the payments he receives until

the taxable year in which his total receipts from the fund exceed \$28,000 (\$50,000 - \$22,000). F will include any excess over the \$28,000 in his gross income for that taxable year. Thereafter, F will include in his gross income the entire amount of any payments made to him from the fund.

Example (6). Assume the facts are the same as in example (1), except that the total investment in the contract is made after June 30, 1986, that A is to receive payments under the life annuity contract beginning on January 31, 1987, and that B will begin to receive the monthly payments on January 31, 1992. B will exclude the \$75 monthly payments from gross income throughout 1992, 1993, and 1994. B will exclude only the first two monthly payments and \$21 of the third monthly payment in 1995. This is determined as follows:

A's investment in the contract (unadjusted).....	\$3,600
Multiple from Table VII, age 60, 10 years (percent).....	4
Subtract value of the refund feature (4 percent of \$3,600).....	\$144
Investment in the contract adjusted for the present value of the refund feature without discount for interest.....	\$3,456
Aggregate of premiums or other consideration paid.....	\$3,600.00
A's exclusion ratio (\$3,456 ÷ \$21,780 [\$900 × 24.2]) (percent).....	15.9
Subtract amount excludable during five years A received payments (15.9 percent of \$4,500 [\$900 × 5]).....	\$715.50
Remainder of aggregate of premiums or other consideration paid excludable from gross income of B under section 72(e).....	\$2,884.50

As a result of the above computation, the number of payments to B which will exhaust the remainder of consideration paid which is excludable from gross income of the recipient is 38 23/50 (\$2,884.50 ÷ \$75) and B will exclude the payments from gross income for three years, then exclude only the first two monthly payments and \$34.50 of the third. Thereafter B shall include the entire amount of all payments received in gross income.

(3) For the purpose of applying the rule contained in subparagraph (1) of this paragraph, it is immaterial whether the recipient of the amount received in full discharge of the obligation is the same person as the recipient of amounts previously received under the contract which were excludable from gross income, except in the case of a contract transferred for a valuable consideration, with respect to which see paragraph (a) of § 1.72-10. For the limit on the tax, for taxable years beginning before January 1, 1964, attributable to the receipt of a

lump sum to which this paragraph applies, see paragraph (g) of this section.

§ 1.403 [Amended]

Par. 8. Section 1.403(b)-1 (d)(4) is amended by adding the words "to a defined benefit plan" following the words "employer contributions" in the first sentence.

Par. 9. Section 1.403(b)-1 (d)(4)(ii) is amended by removing the words "the employee's sex and the".

Par. 10. Section 1.403(b)-1 (d)(4) is amended by revising Tables I and II and paragraph (d)(4)(iv) to read as follows:

§ 1.403(b)-1 Taxability of beneficiary under annuity purchased by section 501(c)(3) organization or public school.

(d) *Exclusion allowance*—(1) * * *
(4) *Determination of excludable amounts by allocation of contributions.* * * *

(iv) The lesser of the number of years of service credited through the end of the taxable year or the number of years that the plan has been in existence at such time.

TABLE I.—VALUE AT NORMAL RETIREMENT AGES OF ANNUITY OF \$1.00 PER ANNUM PAYABLE IN EQUAL MONTHLY INSTALLMENTS DURING THE LIFE OF THE EMPLOYEE

[For taxable years beginning after July 1, 1986]

Ages	Values
40	11.49
41	11.40
42	11.31
43	11.22
44	11.12
45	11.01
46	10.91
47	10.79
48	10.68
49	10.56
50	10.43
51	10.30
52	10.18
53	10.04
54	9.89
55	9.75
56	9.60
57	9.44
58	9.28
59	9.13
60	8.96
61	8.79
62	8.62
63	8.44
64	8.25
65	8.06
66	7.88
67	7.70
68	7.50

TABLE I.—VALUE AT NORMAL RETIREMENT AGES OF ANNUITY OF \$1.00 PER ANNUM PAYABLE IN EQUAL MONTHLY INSTALLMENTS DURING THE LIFE OF THE EMPLOYEE—Continued

[For taxable years beginning after July 1, 1986]

Ages	Values
69	7.29
70	7.10
71	6.88
72	6.68
73	6.46
74	6.25
75	6.03
76	5.82
77	5.61
78	5.40
79	5.20
80	4.99

Note.—If the normal form of retirement benefit under the plan is other than a straight life annuity, the value from Table I above should be divided by the figure set forth below opposite the normal form of retirement benefit provided by the plan:

Annuity for 5 years certain and life thereafter.....	0.97
Annuity for 10 years certain and life thereafter.....	0.90
Annuity for 15 years certain and life thereafter.....	0.80
Annuity for 20 years certain and life thereafter.....	0.70
Life annuity with installment refund...	0.80
Life annuity with cash refund ¹	0.75

¹ The term "cash refund" refers to refund of accumulated employer contributions, and does not refer to refund of employee contributions only, often referred to as "modified cash refund".

TABLE II.—LEVEL ANNUAL CONTRIBUTION WHICH WILL ACCUMULATE TO \$1.00 AT END OF NUMBER OF YEARS

[For taxable years beginning after July 1, 1986]

Number of years	Amounts
1	\$1.0000
2	.4808
3	.3080
4	.2219
5	.1705
6	.1363
7	.1121
8	.0940
9	.0801
10	.0690
11	.0601
12	.0527
13	.0465
14	.0413
15	.0368
16	.0330
17	.0296
18	.0267
19	.0241

TABLE II.—LEVEL ANNUAL CONTRIBUTION WHICH WILL ACCUMULATE TO \$1.00 AT END OF NUMBER OF YEARS—Continued

[For taxable years beginning after July 1, 1986]

Number of years	Amounts
20	.0219
21	.0198
22	.0180
23	.0164
24	.0150
25	.0137
26	.0125
27	.0114
28	.0105
29	.0096
30	.0088
31	.0081
32	.0075
33	.0069
34	.0063
35	.0058
36	.0053
37	.0049
38	.0045
39	.0042
40	.0039
41	.0036
42	.0033
43	.0030
44	.0028
45	.0026
46	.0024
47	.0022
48	.0020
49	.0019
50	.0017

§ 1.401(a)-18 [Removed]

Par. 11. Section 1.401(a)-18 is removed.

§ 1.401(j)-1 through 1.401(j)-6 [Removed]

Par. 12. Sections 1.401(j)-1 through 1.401(j)-6 are removed.

PART 602—REPORTING AND RECORDKEEPING REQUIREMENTS

Par. 13. The authority for Part 602 continues to read as follows:

Authority: 26 U.S.C. 7805.

§ 602.101 [Amended]

Par. 14. Section 602.101(c) is amended by inserting in the appropriate places in the table "§ 1.72-6. . . 1545-0074" and "§ 1.72-9. . . 1545-0074".

Lawrence B. Gibbs,
Commissioner of Internal Revenue.
Approved: November 28, 1986.

J. Roger Mentz,
Assistant Secretary of the Treasury.
[FR Doc. 86-28455 Filed 12-16-86; 3:59 pm]
BILLING CODE 4830-01-M