

Question #10

Answer: E

$$d = 0.05 \rightarrow v = 0.95$$

At issue

$$A_{40} = \sum_{k=0}^{49} v^{k+1} {}_k|q_{40} = 0.02(v^1 + \dots + v^{50}) = 0.02v(1 - v^{50})/d = 0.35076$$

$$\text{and } \ddot{a}_{40} = (1 - A_{40})/d = (1 - 0.35076)/0.05 = 12.9848$$

$$\text{so } P_{40} = \frac{1000A_{40}}{\ddot{a}_{40}} = \frac{350.76}{12.9848} = 27.013$$

$$E({}_{10}L | K_{40} \geq 10) = 1000A_{50}^{\text{Revised}} - P_{40}\ddot{a}_{50}^{\text{Revised}} = 549.18 - (27.013)(9.0164) = 305.62$$

where

$$A_{50}^{\text{Revised}} = \sum_{k=0}^{24} v^{k+1} {}_k|q_{50}^{\text{Revised}} = 0.04(v^1 + \dots + v^{25}) = 0.04v(1 - v^{25})/d = 0.54918$$

$$\text{and } \ddot{a}_{50}^{\text{Revised}} = (1 - A_{50}^{\text{Revised}})/d = (1 - 0.54918)/0.05 = 9.0164$$