

### Question #222

Answer: A

$${}_{15}V = P_{25} \ddot{s}_{25:\overline{15}|} - \frac{A_{25:\overline{15}|}^1}{{}_{15}E_{25}} \quad (\text{this is the retrospective reserve calculation})$$

$$\begin{aligned} P_{25:\overline{15}|}^1 &= P_{25:\overline{15}|} - P_{25:\overline{15}|}^1 = 0.05332 - 0.05107 \\ &= 0.00225 \end{aligned}$$

$$= \frac{A_{25:\overline{15}|}^1}{\ddot{a}_{25:\overline{15}|}}$$

$$0.05107 = P_{25:\overline{15}|}^1 = \frac{{}_{15}E_{25}}{\ddot{a}_{25:\overline{15}|}} = \frac{1}{\ddot{s}_{25:\overline{15}|}}$$

$$\frac{A_{25:\overline{15}|}^1}{{}_{15}E_{25}} = \frac{A_{25:\overline{15}|}^1 / \ddot{a}_{25:\overline{15}|}}{{}_{15}E_{25} / \ddot{a}_{25:\overline{15}|}} = \frac{0.00225}{0.05107} = 0.04406$$

$$P_{25} \ddot{s}_{25:\overline{15}|} = \frac{0.01128}{0.05107} = 0.22087$$

$$25,000 {}_{15}V = 25,000(0.22087 - 0.04406) = 25,000(0.17681) = 4420$$

There are other ways of getting to the answer, for example writing

A: the retrospective reserve formula for  ${}_{15}V$ .

B: the retrospective reserve formula for the 15<sup>th</sup> benefit reserve for a 15-year term insurance issued to (25), which = 0

Subtract B from A to get

$$\left( P_{25} - P_{25:\overline{15}|}^1 \right) \ddot{s}_{25:\overline{15}|} = {}_{15}V$$