

Question #156

Answer: C

$$\begin{aligned}({}_9V + P)(1.03) &= q_{x+9}b + (1 - q_{x+9}){}_{10}V \\ &= q_{x+9}(b - {}_{10}V) + {}_{10}V\end{aligned}$$

$$\begin{aligned}(343)(1.03) &= 0.02904(872) + {}_{10}V \\ \Rightarrow {}_{10}V &= 327.97\end{aligned}$$

$$b = (b - {}_{10}V) + {}_{10}V = 872 + 327.97 = 1199.97$$

$$\begin{aligned}P &= b \left(\frac{1}{\ddot{a}_x} - d \right) = 1200 \left(\frac{1}{14.65976} - \frac{0.03}{1.03} \right) \\ &= 46.92\end{aligned}$$

$${}_9V = \text{benefit reserve at the start of year ten} - P = 343 - 46.92 = 296.08$$