

Question #296

Answer: A

Policy 1:

$$\begin{aligned} AV_{37}^1 &= [AV_{36} + G - E - (100,000 - AV_{37}^1) {}_{1/12}q_{63} / 1.004](1.004) \\ &= (AV_{36} + G - E)1.004 - 100,000 {}_{1/12}q_{63} + AV_{37}^1 {}_{1/12}q_{63} \\ &= [(AV_{36} + G - E)1.004 - 100,000 {}_{1/12}q_{63}] / (1 - {}_{1/12}q_{63}) \end{aligned}$$

Policy 2

$$\begin{aligned} AV_{37}^2 &= [AV_{36} + G - E - 100,000 {}_{1/12}q_{63} / 1.004](1.004) \\ &= (AV_{36} + G - E)1.004 - 100,000 {}_{1/12}q_{63} \end{aligned}$$

Because the starting account value, G and E are identical for both policies:

$$AV_{36}^1 / AV_{36}^2 = 1 / (1 - {}_{1/12}q_{63}) = 1 / [1 - (1/12)(0.01788)] = 1.0015.$$