

Question #46

Answer: B

$$\begin{aligned} {}_{10}E_{30:40} &= {}_{10}p_{30} {}_{10}p_{40} v^{10} = ({}_{10}p_{30} v^{10}) ({}_{10}p_{40} v^{10}) (1+i)^{10} \\ &= ({}_{10}E_{30}) ({}_{10}E_{40}) (1+i)^{10} \\ &= (0.54733)(0.53667)(1.79085) \\ &= 0.52604 \end{aligned}$$

The above is only one of many possible ways to evaluate ${}_{10}p_{30} {}_{10}p_{40} v^{10}$, all of which should give 0.52604

$$\begin{aligned} a_{\overline{30:40:10}|} &= a_{30:40} - {}_{10}E_{30:40} a_{30+10:40+10} \\ &= (\ddot{a}_{30:40} - 1) - (0.52604)(\ddot{a}_{40:50} - 1) \\ &= (13.2068) - (0.52604)(11.4784) \\ &= 7.1687 \end{aligned}$$