

### Question #250

Answer: C

$$\begin{aligned} {}_2p_{[x]+1}^{11} &= p_{[x]+1}^{11}p_{[x]+2}^{11} + p_{[x]+1}^{12}p_{[x]+2}^{21} \\ &= \left(0.7 + \frac{0.1}{2}\right)\left(0.7 + \frac{0.1}{3}\right) + \left(0.3 - \frac{0.1}{2}\right)\left(0.4 - \frac{0.2}{3}\right) \\ &= 0.75(0.7333) + 0.25(0.3333) = 0.6333 \end{aligned}$$

Note that Anne might have changed states many times during each year, but the annual transition probabilities incorporate those possibilities.