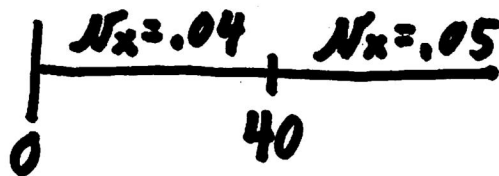


Solution #65

Given:

$$\mu_x = \begin{cases} .04, & 0 \leq x < 40 \\ .05, & x \geq 40 \end{cases}$$



Calculate $\overset{\circ}{e}_{25:\overline{25}|}$

Complete expectation of life

$$\begin{aligned} \overset{\circ}{e}_{x:\overline{n}|} &= \int_0^n t \cdot {}_tP_x \mu_{x+t} dt + n \cdot {}_n P_x \\ &= \int_0^n {}_tP_x dt \end{aligned}$$

$$\overset{\circ}{e}_{25:\overline{25}|} = \overset{\circ}{e}_{25:\overline{15}|} + \overset{\circ}{e}_{40:\overline{10}|} \cdot {}_{15}P_{25}$$

$$\begin{aligned} \overset{\circ}{e}_{25:\overline{15}|} &= \int_0^{15} {}_tP_{25} dt = \int_0^{15} e^{-.04t} dt \\ &= 11.2797091 \end{aligned}$$

$$\begin{aligned} \overset{\circ}{e}_{40:\overline{10}|} &= \int_0^{10} {}_tP_{40} dt = \int_0^{10} e^{-.05t} dt \\ &= 7.8693868 \end{aligned}$$

$${}_{15}P_{25} = e^{-.04 \cdot 15} = e^{-.6} = .548811636$$

$$\begin{aligned} \overset{\circ}{e}_{25:\overline{25}|} &= 11.2797 + 7.869 \cdot .5488 \\ &= 15.5985 \approx 15.6 \end{aligned}$$

E