Solution #33

Triple decrement table

constant forces of mortality:

$\mu^{(1)} = .3$

$\mu^{(2)} = .5$

$\mu^{(3)} = .7$

Calculate $q_x^{(2)}$ → $q_x^{(2)} = \frac{\mu^{(2)}}{\mu^{(\tau)}} q_x^{(\tau)}$

(derived from)

$$q_x^{(2)} = q_x^{(\tau)} \left[\frac{\ln p_x'^{(2)}}{\ln p_x^{(\tau)}} \right] \qquad p_x = e^{-\mu}$$

$$= q_x^{(\tau)} \left[\frac{\ln e^{-\mu^{(2)}}}{\ln e^{-\mu^{(\tau)}}} \right]$$

$$= q_x^{(\tau)} \left[\frac{\mu^{(2)}}{\mu^{(\tau)}} \right]$$

$\mu^{(\tau)} = \sum_i \mu^{(i)}$

$= .3 + .5 + .7 = 1.5$

$q_x^{(\tau)} = 1 - e^{-\mu^{(\tau)}}$

$= 1 - e^{-1.5}$

$= .7769$

$$q_x^{(2)} = \frac{.5}{1.5}(.7769) = .259$$

$= .259$ **A**