MATH 3630 - Actuarial Mathematics I
Fall 2016 - Valdez
Quiz No. 3
Wednesday, 3 October 2016

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The following is an extract from a mortality table:

x	ℓ_x	d_x	p_x	q_x
95	–	–	–	0.40
96	–	–	0.20	–
97	–	72	–	1.00

72 since $q_{97} = 1.00$

You are also given:

- $\ell_{90} = 1000$ and $\ell_{93} = 825$
- Deaths are uniformly distributed (UDD) over each year of age.

Calculate ${}_{3|2.5}q_{90}$.

$$= \frac{\ell_{93} - \ell_{95.5}}{\ell_{90}}$$

$$= \frac{825 - 0.5(\ell_{95} + \ell_{96})}{1000}$$

$$= \frac{825 - 0.5(600 + 360)}{1000}$$

$$= \frac{825 - 480}{1000} = \frac{345}{1000} = 0.345$$

$$p_{96} = 0.20 = \frac{\ell_{97}}{\ell_{96}} \Rightarrow \ell_{96} = \frac{72}{0.20} = 360$$

$$p_{95} = 1 - 0.4 = 0.6 = \frac{\ell_{96}}{\ell_{95}}$$

$$\Rightarrow \ell_{95} = \frac{\ell_{96}}{0.60} = \frac{360}{0.60} = 600$$