

**SOA Exam MLC  
CAS Exam 3L**

2008 Edition

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**Product Preview**



**Flashcards**

## Force of Mortality

$$\mu_x = \lambda_x(x) = -\frac{d}{dx} \ln S_X(x)$$

$e_x^o$  in life table symbols

$${}^0e_x = \int_0^\infty {}_tP_x dt = \frac{T_x}{\ell_x}$$

Moments of  $Z_x$

$$E[Z_x] = A_x = \sum_{k=1}^{\infty} v^k \cdot {}_{k-1}q_x$$

$$E[Z_x^2] = {}^2A_x = \sum_{k=1}^{\infty} (v')^k \cdot {}_{k-1}q_x,$$

$$\text{where } v' = v^2 = e^{-2\delta}$$

$$\text{Var}(Z_x) = {}^2A_x - A_x^2$$

Relation of  $\ddot{a}_x$ ,  $\ddot{a}_{x:\overline{n}|}$ ,  ${}_n|\ddot{a}_x$

$$\ddot{a}_x = \ddot{a}_{x:\overline{n}|} + {}_n| \ddot{a}_x$$

Whole life annuity APV's for joint-life and last survivor statuses

$$a_{xy} = \sum_{t=1}^{\infty} v^t \cdot {}_t p_{xy}$$

$$\ddot{a}_{xy} = \sum_{t=0}^{\infty} v^t \cdot {}_t p_{xy} = a_{xy} + 1$$

$$a_{\overline{xy}} = \sum_{t=1}^{\infty} v^t \cdot {}_t p_{\overline{xy}} = a_x + a_y - a_{xy}$$

$$\ddot{a}_{\overline{xy}} = \sum_{t=1}^{\infty} v^t \cdot {}_t p_{\overline{xy}} = \ddot{a}_x + \ddot{a}_y - \ddot{a}_{xy}$$