

Michigan State University
STT 456 - Actuarial Models II
Class Test 2
Wednesday, 8 April 2015
BONUS: 20 points

Please write your name at the space provided:

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For two lives (x) and (y) with independent future lifetimes, you are given:

- ${}_nq_x = 0.0400$
- ${}_nq_{xy} = 0.1216$

Calculate ${}_nq_{\overline{xy}}$.

(Please turn over for more spaces to write your solution.)

First we solve ${}_nq_y$ by noticing that ${}_nq_{xy} = 1 - {}_n p_{xy} = 1 - {}_n p_x \cdot {}_n p_y$

so that

$${}_n p_y = \frac{1 - {}_n q_{xy}}{{}_n p_x} = \frac{1 - 0.1216}{1 - 0.04} = 0.915$$

$${}_n q_y = 1 - 0.915 = 0.085$$

Thus,

$$\begin{aligned} {}_n q_{\overline{xy}} &= {}_n q_x + {}_n q_y - {}_n q_{xy} \\ &= 0.04 + 0.085 - 0.1216 \\ &= \underline{\underline{0.0034}} \quad \checkmark \end{aligned}$$

EXTRA PAGE FOR DETAILS OF SOLUTION