

MATH 3631 - Actuarial Mathematics II  
Spring 2020 - Valdez  
Quiz No. 5  
Monday, 30 March 2020

Name: EMIL

Student ID: Suggested Solutions

You are given:

- The probability that  $(x)$  survives the following year is 0.97.
- The probability that  $(y)$  survives the following year is 0.90.
- The two lives  $(x)$  and  $(y)$  have independent future lifetimes.
- Deaths are uniformly distributed over each year of age.

Calculate  ${}_{0.5}q_{\overline{xy}}$ .

$$\begin{aligned} {}_{0.5}q_{\overline{xy}} &= {}_{0.5}q_x * {}_{0.5}q_y \\ &= {}_{0.5}q_x * {}_{0.5}q_x \\ &= 0.5(0.03) * 0.5(0.10) = \underline{0.00075} \end{aligned}$$

This is the probability that the status  $(\overline{xy})$  fails, that is, both  $(x)$  and  $(y)$  die within next half year!