

MATH 3630 - Actuarial Mathematics I
Fall 2017 - Valdez
Quiz No. 5
Wednesday, 25 October 2017

Name: Emil

Student ID: Suggest a Solution

Two life insurance policies issued to (45) are actuarially equivalent (that is, they have equal actuarial present values):

- A whole life insurance of 200 payable at the end of the year of death. $\rightarrow 200 A_{45}$
- A special whole life insurance, also payable at the end of the year of death, that pays 75 for the first 10 years but increases ~~by~~ to an amount of b thereafter.

You are given:

- $A_{45} = 0.25$
- $A_{45:\overline{10}|}^1 = 0.03$

Calculate the value of b .

$\rightarrow 200 A_{45}$
 \downarrow
 $75 A_{45} + (b-75) {}_{10}E_{45} A_{55}$
 \swarrow
 Set these two equal, we get

$$b = \frac{125 A_{45}}{{}_{10}E_{45} A_{55}} + 75$$

$$\begin{array}{ccccc}
 A_{45} & = & A_{45:\overline{10}|}^1 & + & {}_{10}E_{45} A_{55} \\
 \downarrow & & \downarrow & & \downarrow \\
 0.25 & & 0.03 & & 0.22
 \end{array}$$

Thus, we have

$$\begin{aligned}
 b &= \frac{125 (0.25)}{0.22} + 75 \\
 &= \underline{\underline{217.0455}}
 \end{aligned}$$

