

MATH 3630 - Actuarial Mathematics I
 Fall 2016 - Valdez
 Quiz No. 4
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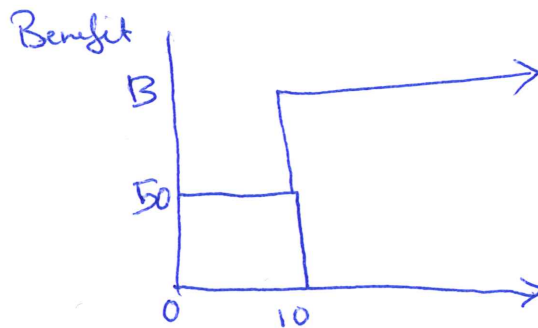
Student ID: Suggested Solutions

Two life insurance policies issued to (40) are actuarially equivalent (that is, they have equal actuarial present values):

- A whole life insurance of 100 payable at the moment of death.
- A special whole life insurance, also payable at the moment of death, that pays 50 for the first 10 years but increases ~~to~~ an amount of B thereafter.

You are given:

- $\delta = 5\%$
- $\bar{A}_{40} = 0.29$
- $\bar{A}_{50} = 0.40$
- $\bar{A}_{40:\overline{10}|}^1 = 0.08$



Calculate the value of B .

$$100 \bar{A}_{40} = 50 \bar{A}_{40} + (B-50) {}_{10}E_{40} \bar{A}_{50}$$

Solving for B , we get

$$B = \frac{50 \bar{A}_{40}}{{}_{10}E_{40} \bar{A}_{50}} + 50$$

$\underbrace{\quad}_{.525}$
 $\underbrace{\quad}_{0.40}$

$$\bar{A}_{40} = \bar{A}_{40:\overline{10}|}^1 + {}_{10}E_{40} \bar{A}_{50}$$

$$\frac{0.29 - 0.08}{0.40} = {}_{10}E_{40} \Rightarrow {}_{10}E_{40} = \frac{.21}{.40} = .525$$

Thus, $B = \frac{50(.29)}{.525(.4)} + 50 = \underline{\underline{119.0476}}$