MATH 3630 - Actuarial Mathematics I
Fall 2015 - Valdez
Homework No. 4
due Monday, 5:00 PM, 2 November 2015

Please return this page with your signature. Please write your name and student number at the spaces provided:

Name: Suggested Solution **Student ID:** Emil

I certify that this is my own work, and that I have not copied the work of another student.

Signature: _____ **Date:** _____

A life insurance policy is issued to age 40 with the following varying scale of death benefits:

age	death benefit
40-45	250
45-50	500
50-60	1,000
over 60	250

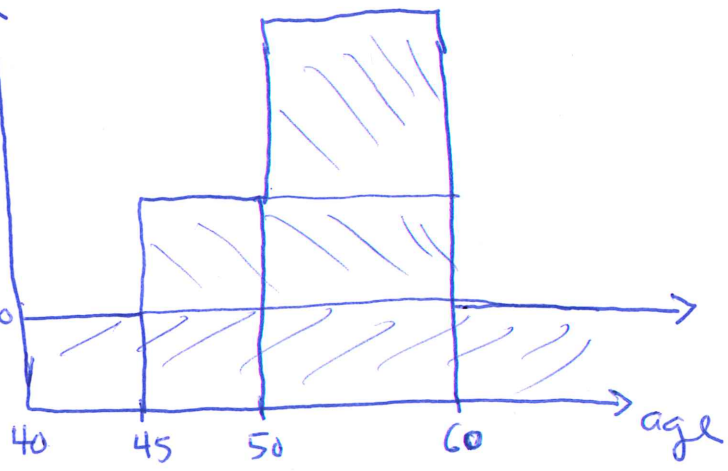
Assume the benefits are payable at the end of the year of death and that:

- mortality follows the Illustrative Life Table; and
- $i = 6\%$.

Calculate the actuarial present value of the benefits for this policy. (Your answer must be a number!)

One way to write the APV is

$$APV = 250\,A_{40} + 250\,{}_5E_{40}\left(A_{45} - {}_{15}E_{45}\,A_{60}\right) + 500\,{}_{10}E_{40}\left(A_{50} - {}_{10}E_{50}\,A_{60}\right)$$



Plug values from ILT @ 6%:

$A_{40} = 0.16132$ $\quad {}_5E_{40} = 0.73529$

$A_{45} = 0.20120$ $\quad {}_{10}E_{40} = 0.53667$

$A_{50} = 0.24905$ $\quad {}_{15}E_{45} = {}_5E_{45} \cdot {}_{10}E_{50} = (0.72988)(0.51081)$

$A_{60} = 0.36913$ $\quad = 0.37283$

${}_{10}E_{50} = 0.51081$

$$APV = 250(0.16132) + 250(0.73529)(0.20120 - 0.37283(0.36913)) + 500(0.53667)(0.24905 - 0.51081(0.36913))$$

$$= \underline{\underline{68.24978}}$$