MATH 3630 - Actuarial Mathematics I
Fall 2016 - Valdez
Quiz No. 8
Monday, 5 December 2016

Name: EMIL **Student ID:** Suggested Solution

For a special two-year endowment insurance issued to (70), you are given:

- A benefit of 10 is payable at the end of the year of death, if he dies before age 72.
- A benefit of $2P$ is payable at age 72, if he survives to reach 72.
- An annual benefit premium of P is payable at the beginning of each year.
- $q_{70} = 0.02$ $q_{71} = 0.03$
- $i = 0.05$

Calculate P.

$$APV(FP_0) = APV(FB_0)$$

$$P + Pv p_{70} = 10\left(vq_{70} + v^2 p_{70} q_{71}\right) + 2P v^2 p_{70} p_{71}$$

$$P\left(1 + vp_{70} - 2v^2 p_{70} p_{71}\right) = 10\left(vq_{70} + v^2 p_{70} q_{71}\right)$$

$$P = \frac{10\frac{1}{1.05}\left(.02 + \frac{1}{1.05}.98(.03)\right)}{1 + \frac{1}{1.05}(.98) - 2\frac{1}{1.05^2}(.98)(0.97)}$$

$$= 2.18845$$

gv
12/5/2016