

Name: \_\_\_\_\_ .

**Homework 3: Due Thursday, March 5, 2015**

1. Exercise 7.1.
2. Exercise 7.2.
3. A special fully discrete whole life insurance on a life aged 45 provides a benefit of 1000 in the first 20 years and 2000 thereafter. Premiums are  $P$  during the first 20 years,  $2P$  thereafter, and are determined by the equivalence principle. You are given:

(a)  $A_{45} = 0.3$

(b)  $A_{45:\overline{20}|}^1 = 0.05$

(c)  $A_{45:\overline{20}|}^{\frac{1}{2}} = 0.5$

(d)  $i = 0.04$

Calculate  ${}_{20}V$ , the 20th terminal reserve, on this insurance.

4. For a fully discrete 5-year deferred 10-year term insurance of 1 on  $(x)$ , premiums are payable for 15 years. You are given:
  - (a)  $q_x = 0.1$  in all years.
  - (b)  $i = 0$
  - (c)  $T$  is the future lifetime random variable.
  - (d)  ${}_tL$  is the random variable for the present value of future losses.

Calculate  $E[{}_{10}L|T > 10]$ .