1. Do problems 8.1, 8.3, 8.9, 8.10, 8.30, and 8.35 from the textbook.

2. (Fall 2003, #30, SOA) Michel, age 45, is expected to experience higher than standard mortality only at age 64. For a special fully discrete whole life insurance of 1 on Michel, you are given:
   (i) The benefit premiums are not level.
   (ii) The benefit premium for year 20, $\pi_{19}$, exceeds $P_{45}$ for a standard risk by 0.010.
   (iii) Benefit reserves on his insurance are the same as benefit reserves for a fully discrete whole life insurance of 1 on (45) with standard mortality and level benefit premiums.
   (iv) $i = 0.03$
   (v) $20V_{45} = 0.427$
   Calculate the excess of $q_{64}$ for Michel over the standard $q_{64}$.

3. (Fall 2004, #38, SOA) You are given:
   (i) $kV^A$ is the benefit reserve at the end of year $k$ for type A insurance, which is a fully discrete 10-payment whole life insurance of 1000 on $(x)$.
   (ii) $kV^B$ is the benefit reserve at the end of year $k$ for type B insurance, which is a fully discrete whole life insurance of 1000 on $(x)$.
   (iii) $q_{x+10} = 0.004$
   (iv) The annual benefit premium for type B is 8.36.
   (v) $10V^A - 10V^B = 101.35$
   (vi) $i = 0.06$
   Calculate $11V^A - 11V^B$.

4. (Spring 2005, #13, SOA) For a fully discrete whole life insurance of $b$ on $(x)$, you are given:
   (i) $q_{x+9} = 0.02904$
   (ii) $i = 0.03$
   (iii) The initial benefit reserve for policy year 10 is 343.
   (iv) The net amount at risk for policy year 10 is 872.
   (v) $\overline{a}_x = 14.65976$
   Calculate the terminal benefit reserve for policy year 9.

5. (Spring 2007, #13, SOA) For a fully discrete 3-year term insurance of 1000 on $(x)$, you are given:
   (i) $i = 0.10$
   (ii) The mortality rates and terminal reserves are given by:
   $q_x = 0.3, q_{x+1} = 0.4, q_{x+2} = 0.5; 1000_1V = 95.833, 1000_2V = 120.833, 1000_3V = 0$
   (iii) $1L$ is the prospective loss random variable at time 1, based on the benefit premium.
   (iv) $K(x)$ is the curtate future lifetime random variable for $(x)$.
   Calculate $\text{Var}(1L|K(x) \geq 1)$. 