

**Homework Assignment # 1 (max. points = 20)**  
**Due at the beginning of class on Thursday January 24, 2008**

Please show your work - enough to show that you understand how to do the problem. Circle your final answer. Full credit can only be given only if the answer and work leading to the answer are correct.

1. At time 0, you invest some money into an account earning 5.75% simple interest. How many years will it take to double your money?
2. At an annual compound interest rate of 5%, how long will it take you to triple your money? (Provide an answer in years, to two decimal places.)
3. You invest \$1,000 now, at an annual simple interest rate of 6%. What is the effective rate of interest in the fifth year of your investment?
4. An investment account earns 4% the first year, 5% the second year, and  $X\%$  the third year. Find  $X$  if the three year average interest rate is 10%.
5. Suppose that the accumulation function for an account is  $a(t) = (1 + 3it)$ . At time 0, you invest \$100 in this account. If the value in the account at time 10 is \$420, what is  $i$ ?
6. You invest \$100 at time 0, at an annual simple interest rate of 9%. How much interest do you earn in the fifth year?
7. Suppose that you invest \$4,000 at time 0 into an investment account with an accumulation function of  $a(t) = \alpha t^2 + 4\beta$ . At time 4, your investment has accumulated to \$5,000. Find the accumulated value of your investment at time 10.
8. Suppose that  $A(t) = \alpha t^2 + 10\beta$ . If  $X$  invested at time 0 accumulates to \$500 at time 4, and to \$1,000 at time 10, find the amount of the original investment,  $X$ .
9. In return for payments of \$2000 at the end of four years and \$5000 at the end of ten years, an investor agrees to pay \$3000 immediately and to make an additional payment at the end of three years. Find the amount of the additional payment if  $i = 0.06$ .
10. Eric deposits  $X$  into a savings account at time 0, which pays interest at a nominal rate of  $i$ , compounded semiannually. Mike deposits  $2X$  into a different savings account at time 0, which pays simple interest at an annual rate of  $i$ . Eric and Mike earn the same amount of interest during the last 6 months of the 8th year. Calculate  $i$ .