

College Mathematics

annuities and loans homework

You may assume the following:

Interest rates are always annual.

Within the same calculation, monthly payments are all equal.

Payments are always made at the *end* of each month.

1. At 3% annual interest, compounded monthly, what is the future value of
 - (a) \$100 per month for 10 years?
 - (b) \$100 per month for 25 years?
 - (c) \$100 per month for 40 years?

2. At 6% annual interest, compounded monthly, what is the future value of
 - (a) \$100 per month for 10 years?
 - (b) \$100 per month for 25 years?
 - (c) \$100 per month for 40 years?

3. At 9% annual interest, compounded monthly, what is the future value of
 - (a) \$100 per month for 10 years?
 - (b) \$100 per month for 25 years?
 - (c) \$100 per month for 40 years?

4. At 12% annual interest, compounded monthly, what is the future value of
 - (a) \$100 per month for 10 years?
 - (b) \$100 per month for 25 years?
 - (c) \$100 per month for 40 years?

5. What monthly payment should you make to an annuity with 8.4% annual growth, compounded monthly, in order to have \$1,000,000 in 30 years?

6. What monthly payment should you make to an annuity with 10.5% annual growth, compounded monthly, in order to have \$2,000,000 in 40 years?

7. What monthly payment will let you pay back a \$16,000 loan at 5.4% interest, compounded monthly,
 - (a) in 3 years?
 - (b) in 5 years?

8. What monthly payment will let you pay back a \$125,000 loan at 6% interest, compounded monthly,
 - (a) in 15 years?
 - (b) in 30 years?

9. Suppose you want to borrow money to buy a car and have your monthly payment be \$250. If the interest rate is 4.8%, compounded monthly, and you want the car to be paid up in 5 years, how big a loan can you afford?

10. Suppose you want to borrow money to buy a house and have your monthly payment be \$800. You qualify for 5.4% interest, compounded monthly.
 - (a) You would like the house to be paid up in 30 years.
How big a mortgage can you afford?
 - (b) You are required to make a down payment of 20% of the cost of the house.
What price house can you afford?