Simple Interest formula

\[ F = P(1 + rt) \]

Compound Interest formula

\[ F = P(1 + i)^m \]

Increasing Annuity

\[ F = (Paymt) \left[ \frac{(1 + i)^m - 1}{i} \right] \]

Note: If payments are being made at the beginning of the month, then replace "payment" above with \( L = (payment)(1 + i) \).

Decreasing Annuity

\[ P = F(1 + i)^{-m} + (Paymt) \left[ \frac{1 - (1 + i)^{-m}}{i} \right] \]

Notation Summary:
- \( F \) = Future Value
- \( P \) = Present Value
- \( Paymt \) = Payment
- \( r \) = annual rate (converted from a percent to a number)
- \( n \) = \# times rate is compounded in one year
- \( i = \frac{r}{n} \) (periodic rate)
- \( m \) = \# interest payments over the life of the investment
- \( t \) = life of the investment, measured in years

Additional Problems to those posted for Chapter 10

1. For a 25-year fixed-rate mortgage in which $150,000 is borrowed, find the monthly payment when the annual interest rate is
   (a) 5.7%
   (b) 7.8%
   (c) 10.4%
   (d) 13.2% Any comments?

2. In problem 1, find the total of all of the 300 payments in each case. Any comments?
3. If you can afford to pay $1200 per month in mortgage payments, find how much you can borrow if you get a 30-year fixed-rate mortgage and the annual interest rate is
   (a) 5.7%
   (b) 7.8%
   (c) 10.4%
   (d) 13.2% Any comments?

4. Suppose you are borrowing $175,000 to buy a house and the annual rate on your mortgage will be 7.8%. Find the monthly payment if the term of the loan is
   (a) 15 years
   (b) 20 years
   (c) 25 years
   (d) 30 years.

5. In Problem 4, find the total of all the payments in each case.

6. You have saved $1,000,000, and have thus decided to retire. You have moved all of your money into a safe account which you expect will earn you approximately 5% per year during your retirement years. How much money will you receive each month if you expect this money to last you
   (a) 15 years
   (b) 20 years
   (c) 30 years
   What is annual income for each of these time intervals?

7. You would like to take 5 years to save for a down payment on a house. You decided that you can afford to put away $200 a month, and have found a bank account that will earn you 4.5%. How much money will you have at the end of 5 years?

8. Assuming that you want to put a 10% down payment on your house, using your down payment saved in problem 7, how much can you afford to pay for a home?