Section 6.1: Interest and Effective Rates

Pr 1. You borrowed \$1000 from a quick loan business for 52 days, at a simple interest rate of 42% per year. What is the interest you will pay on the loan?

Pr 2. Suppose that \$3000 accumulated to \$4529.96 in an investment certificate, compounded weekly. If the annual interest rate is 2.3%, then how much time has passed?

N =
I% =
PV =
PMT =
FV =
P/Y =
C/Y =
PMT: END BEGIN

Pr 3. How much should be invested now into an account paying 6.25% annual interest, compounded quarterly, for it to accumulate to $6,000 in 3 years?

N =
I% =
PV =
PMT =
FV =
P/Y =
C/Y =
PMT: END BEGIN

Pr 4. How long will an investment need to remain in an account with a 2.028% annual interest rate, compounded continuously, in order for the investment to increase by 50%?

Pr 5. Consider the following three accounts:

A - interest rate 3.26%, compounded quarterly

B - interest rate 3.25%, compounded weekly

C - interest rate 3.24%, compounded continuously.

(a) Compute the effective interest rates for each of these accounts

(b) Which account is the best one to use for investing?

Section 6.2: Annuities, Sinking Funds, and Amortization

Pr 1. You have just given birth to a child. You decide to save up for their college education. You make an initial deposit of $2000 into an account that earns 2.4 % interest, compounded monthly. You also put $500 per month into the account. How much will be in the account after 18 years?

N =
I% =
PV =
PMT =
FV =
P/Y =
C/Y =
PMT: END BEGIN

Pr 2. You have just started your career. Your goal is to have one million dollars in your savings account when you retire 30 years from now. Your savings account earns 1.2% interest, compounded monthly. How much do you need to put into the account each month to reach your retirement goals?

N =
I% =
PV =
PMT =
FV =
P/Y =
C/Y =
PMT: END BEGIN

Pr 3. You borrowed $ 27,000 in subsidized loans to pay tuition for four years of college. Now that you have been out of college for a year, your loan company is going to start charging annual interest at a rate of 3.5%, compounded monthly. You find that you can afford to pay $300 per month. How long will it take to pay off the loan?

N =
I% =
PV =
PMT =
FV =
P/Y =
C/Y =
PMT: END BEGIN

Pr 4. Congratulations, you won 10 million in the lottery. The lottery gives you 30 annual payments. Suppose that the account has a 2.7% annual interest, compounded monthly. How much money will the lottery give you if you choose to take the lump sum instead?

N =
I% =
PV =
PMT =
FV =
P/Y =
C/Y =
PMT: END BEGIN

Pr 5. Ten years ago, we decided to buy a house for $280,000. To avoid having to pay mortgage insurance, we decided to make a 20% down payment. We took out a 30-year loan for the rest. The loan charges 4.6% interest, compounded monthly.

(a) How much was the original amount of the loan?

(b) How much have we paid in interest on the loan so far?

(c) What is the outstanding principal on the loan?

Ten years ago, we decided to buy a house for $280,000. To avoid having to pay mortgage insurance, we decided to make a 20% down payment. We took out a 30-year loan for the rest. The loan charges 4.6% interest, compounded monthly.

(d) What is the current equity for the house?

(e) How much of the first payment went towards interest, and how much went towards the principal?