## 8.5 Notes - Installment Loans, Amortization, and Credit Cards

A loan that you pay off with regular payments is called an **installment loan** (or amortized loan).

**Mortgage Basics:**

A **mortgage** is a long-term installment loan designed specifically to finance a home.

A **down payment** is the portion of the sale price of the home that the buyer initially pays the **seller**. The down payment is a percentage of the sale price of the home. The **amount of the mortgage** is the difference between the sale price and the down payment.

Closing **costs** are fees you must pay up front to the **lender** in order to be given the loan. They may include a variety of direct costs, or fees charged as **points**, where each point is 1% of the loan amount. In most cases, lenders are required to give you a clear assessment of closing costs before you sign for the loan.

**Fixed-rate mortgages** have the same monthly payment during the entire time of the loan. The interest rate does not change for the life of the loan. Most fixed rate loans have a term of either 15 or 30 years. You can calculate the payments using the loan payment formula on page 483 or by using the TVM Solver.

Adjustable rate mortgages (ARMS) have payment amounts that change from time to time depending on changes in the interest rate.

1) The price of a home is $195,000. The bank requires a 10% down payment and two points at the time of closing. The cost of the home is financed with a 15-year fixed-rate mortgage at 7.5%.

a) Find the required down payment.

b) Find the amount of the mortgage.

c) How much must be paid for the two points at closing?

d) Find the monthly payment (excluding taxes and insurance).

    N =
    I% =
    PV =
    PMT =
    FV =
    P/Y =
    C/Y =

e) Find the total interest paid over 15 years.

2) The price of a home is $140,000.  The bank requires a 15% down payment.  The buyer has 2 options:

Option A:  15-year fixed at 5% with
            closing costs of $1000 plus 1 point

    N =
    I% =
    PV =
    PMT =
    FV =
    P/Y =
    C/Y =

Option B:  30-year fixed at 6%

    N =
    I% =
    PV =
    PMT =
    FV =
    P/Y =
    C/Y =

Which loan has the greater total cost (closing costs + amount paid for points + total cost of interest)?

The TVM Solver can also calculate payments for other types of installment loans, such as car loans, student loans, and paying off a credit card balance (in which no further purchases are made).

3) You decide to borrow $15,000 for a new car.  You can select one of the following loans, each requiring regular monthly payments:

      Installment Loan A:  4-year at 8%  or   Installment Loan B:  6-year at 10%

a) Find the monthly payments and the total interest for Loan A.

    N =
    I% =
    PV =
    PMT =
    FV =
    P/Y =
    C/Y =

b) Find the monthly payments and the total interest for Loan B.

c) Compare the monthly payments and the total interest for the 2 loans.

4) Your credit card has a balance of $6400 and an annual interest rate of 24%.  You decide to pay off the balance by making equal monthly payments over the next 5 years.  If there are no further purchases charged to the card,

a) How much must you pay each month?

N =
I% =
PV =
PMT =
FV =
P/Y =
C/Y =

b) How much total interest must you pay?

5) To pay off the credit card balance in #4, you decide to get a bank loan at 12% with a term of 6 years.

a) How much will you pay each month?

N =
I% =
PV =
PMT =
FV =
P/Y =
C/Y =

b) How does this compare with the credit card payment?

c) How much total interest will you pay?

d) How does this compare with 4b?

When a loan is paid off through a series of regular payments, it is said to be **amortized**, which literally means "killed off". A **loan amortization schedule** is a listing of each payment and how much of that payment goes towards interest and how much of that payment goes towards the principal. It also shows the current balance of the loan.

6) You have a home mortgage of $200,000 with a fixed rate of 7.0% for 20 years.

    a) Find the monthly mortgage payment.

    b) Fill in the loan amortization schedule below showing the amount of the monthly payment that goes towards interest, the amount that goes towards the principal, and the balance of the loan.

    c) What do you notice about the payment toward the principal during the term of the loan?

    d) What do you notice about the payment toward interest during the term of the loan?

**Loan Amortization Schedule**

| Payment Number | Interest Payment | Principal Payment | Balance of Loan |
|---|---|---|---|
| | Interest= Balance of loan x (r/12) | Principal Payment= Monthly Payment- Interest Payment | Balance of Loan= Principle Balance- Principle Payment |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |