

Math 1050 Mortgage Project

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Due date: 4/19/13

In this project we will examine a home loan or mortgage. Assume that you have found a home for sale and have agreed to a purchase price of \$201,000.

**Down Payment:** You are going to make a 10% down payment on the house. Determine the amount of your down payment and the balance to finance.

Down Payment \$20,100

Mortgage Amount \$180,900

Part I: 30 year Mortgage

**Monthly Payment:** Calculate the monthly payment for a 30 year loan (rounding up to the nearest cent) by using the following formula. **Show your work.** [PMT is the monthly loan payment,  $P$  is the mortgage amount,  $r$  is the annual percent rate for the loan in decimal, and  $Y$  is the number of years to pay off the loan.] For the 30 year loan use an annual interest rate of 4.975%.

$$PMT = \frac{P \left( \frac{r}{12} \right)}{1 - \left( 1 + \frac{r}{12} \right)^{-12Y}}$$

Show work here

$$PMT = \frac{180,900 \left( \frac{0.04975}{12} \right)}{1 - \left( 1 + \frac{0.04975}{12} \right)^{-12(30)}} = \frac{749.98125}{1 - (1.0041458)^{-360}} = \frac{749.89125}{.77449} = \$968.35$$

Monthly Payment for a 30 year mortgage \$968.35

Note that this monthly payment covers only the interest and the principal on the loan. It **does not** cover any insurance or taxes on the property.

**Amortization Schedule:** In order to summarize all the information regarding the amortization of a loan, construct a schedule that keeps track of the payment number, the principal paid, the interest, and the unpaid balance. A spreadsheet program is an excellent tool to develop an

amortization schedule. We can use a free amortization spreadsheet on the web. The web address is: <http://www.bretwhissel.net/amortization/amortize.html>. Enter the **amount of the loan**, i.e. the selling price minus the down payment, the **interest rate**, and the appropriate **number of years**. Check the box to show the schedule.

Amortization Schedule monthly payment for a 30 year mortgage \$ 968.35  
(Note: if this is more than 2 or 3 cents different from your calculation, check your numbers!)

Total interest paid over 30 years \$ 167,706

Total amount paid \$ 348,606

Notice that the amount of the payment that goes towards the principal and the amount that goes towards the interest are not constant. What do you observe about each of these values?

*As time goes on the amount payed towards interest goes down while the amount payed towards principal goes up.*

Number of first payment when more of payment goes toward principal than interest 194th

As already mentioned, these payments are for principal and interest only. You will also have monthly payments for home insurance and property taxes. In addition, it is helpful to have money left over for those little luxuries like electricity, running water, and food. As a wise home owner, you decide that your monthly principal and interest payment should not exceed 35% of your monthly take-home pay. What minimum monthly take-home pay should you have in order to meet this goal? Show your work for making this calculation.

Show work here

$$\text{Total income} \cdot 35\% = 968.35$$

$$\text{Total income} = \frac{968.35}{0.35}$$

$$\text{Total monthly income} = 2766.71$$

Minimum monthly take home pay = \$ 2766.71