1877 987 9357

Name: Cory Ohr Due date: _____

# Math 1050 - Project 2 - Buying a House and...Paying For It

In this project we will examine the process of buying a house. We will look at important considerations when selecting a mortgage ("mortgage" is a fancy word for a home loan). We will also look at possible ways to save money on your mortgage.

53 +5 58

## Part I: Finding a House, Loan Amount, and Interest Rates

1. Select a house from a newspaper, real estate booklet, or a website. Be realistic about your selection. Choose a house that is in a reasonable price range. (Minimum of $100,000 and maximum of $500,000.) Attach a picture and description of the house to the end of this project.

2. Assume you will pay the asking price for the home. Put the asking price here: $269900

3. Most mortgages require a significant down payment. To get the best rate and payment on a mortgage you will typically need to put 20% down. You will then get a mortgage loan for the other 80%. Calculate your down payment and mortgage loan amount and list them below.

Down Payment: $53,980 Mortgage Amount: $215,920

There are many different types of mortgages. Most people work with a loan officer to figure out what type of mortgage best fits their needs. Many people even decide what type of mortgage they need before they start looking for a house. To keep this project fairly simple, we'll assume that you're going to compare a 30 year fixed rate mortgage and a 15 year fixed rate mortgage. Credit scores (also called FICO scores) are extremely important when obtaining any loan. You should do everything you can to have a good credit score. (You may want to do an internet search to find out how credit scores are determined and what you can do to make sure you have high FICO scores.)

4. Contact a lending institution (a broker, a bank, or a credit union), tell them you're doing a project for school and that you need to get the interest rate on a 30 year and a 15 year fixed rate mortgage. Tell them you're putting 20% down, what your loan amount is, and that you have a 750 FICO score. Record the rates below.

30 Year Interest Rate (750 FICO): 4.25% 15 Year Interest Rate (750 FICO): 3.75%

## Part II: 30 Year Mortgage

5. Calculate the monthly payment for a 30 year mortgage using the following formula. Round the payment to the NEAREST cent. Be sure to show your work.

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

[PMT is the monthly loan payment, *P* is the **Principal Balance** of the mortgage (i.e. loan amount), *r* is the annual percent rate for the loan *as a decimal*, and *Y* is the number of years to pay off the loan.]

$$\frac{215{,}920\left(\frac{4.25\%}{12}\right)}{1-\left(1+\frac{(4.25\%)}{12}\right)^{-12(30)}}$$

Monthly Payment for a 30 year mortgage = $1062.20

*Please note that this monthly payment covers only the principal and the interest on the loan. It **does not cover** any taxes, insurance, or homeowners association (HOA) fees on the property.*

When determining what type of loan you need, it can be helpful to understand how your payment is applied each month. An **Amortization Schedule** can help you understand your loan better. An amortization schedule summarize all the information regarding how much of your payment goes toward the principal, how much goes toward interest, and what the unpaid balance of the loan is at any given time. You may download an Excel template of an amortization schedule at the following MicroSoft address:

http://office.microsoft.com/en-us/templates/TC010197771033.aspx

You can use this amortization schedule on any standard loan. (It will even work on a car loan. You may want to save this spreadsheet for future use.) Open the spreadsheet and enter the information requested regarding your 30 year loan. Use the first day of next month as the start date of the loan.

6. List the following information from the amortization schedule:

a. **Payment Amount:**
(This should agree with what you computed in part 5.)

$ 1062.20

b. **Total Interest Paid Over 30 Years:**
(This might be called "Cumulative Interest".)

$ 166,470.78

c. **Total Amount Repaid:**
(The schedule may not give you this number. There are two ways to figure out how much you paid over the life of the loan. Think for a minute and you can figure one of them out.)

$ 382,390.78
2.67

7. Notice that the amount of the payment that goes towards the principal and the amount that goes towards the interest does not stay the same for every payment. Explain what you observe about these values and why they change the way they do.

As you pay, the amount that goes towards Principle increases, while the amount of the Interest decreases. This is because you are paying off the loan, you pay more than the insured interest.

8. Find the number of the first payment when more of the payment goes toward principal than interest.

Pmt. No. 165

9. As previously mentioned, these payments are for principal and interest only. You will also have to pay monthly for home insurance and property taxes. In addition, it is helpful to have money left over for luxuries like electricity, heat, 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.

Monthly Income $\cdot .35 = 1062.20$

$\frac{1062.20}{.35} =$ Monthly Income

Minimum Monthly Take-Home Pay: $3034.86

10. It is also important to keep in mind that your "net" or take-home pay (after taxes) is less than your gross pay (before taxes). Assuming that your net pay is 75% of your gross pay, what minimum gross monthly salary will you need to make to have the monthly net salary stated above? Show your work for making this calculation.

Gross * .75 = 3034.86 Minimum Monthly Gross Salary: $4046.48

11. Now compute the required Minimum Gross Annual Salary: $48,557.71

## Part III: 15 year Mortgage

12. Calculate the monthly payment for a 15 year mortgage using the formula one page one. Round the payment to the NEAREST cent. Be sure to show your work.

Monthly Payment for a 15 year mortgage = $1,570.22

13. List the following information from the amortization schedule:

a. **Payment Amount:**
(This should agree with what you computed in part 12.) $ 1,570.22

b. **Total Interest Paid Over 15 Years:**
(This might be called "Cumulative Interest".) $ 66,779.37

c. **Total Amount Repaid:**
(The schedule will not give you this number. See if you can figure out both ways to compute this.) $ 282,639.37

14. Find the number of the first payment when more of the payment goes toward principal than interest.

Pmt. No. 1

15. Over the life of the loan, how much money do you save by having a 15 year mortgage versus a 30 year mortgage?

Total Savings: $94,751.41

16. If you saved a significant amount of money, why do you think most people get a 30 year mortgage?

It has a smaller monthly payment, thus people think its cheaper

## Part IV: Extra Principal Payments

17. Suppose you paid an additional $100 towards the principal each month on the 30 year mortgage discussed in Part II. The spreadsheet has a place to enter extra principal payments. Enter $100 on this line and answer the following:

a. How long would it take to pay off the loan with this additional payment? 25 1/3 years

b. What is the total amount of interest paid over the life of the loan? $136,782.79

c. What is the total amount repaid over the life of the loan? $352,702.79

18. Compare the amount in 17 part c with to the total amount repaid without any extra payments in problem 6 part c. How much would you save if you made the extra $100 per month in principal payments?

$29,687.99

## Part V: Reflection

Did this project change the way you think about buying a home? Does the career you're interested in provide the salary you need to have the house you want? How will you save up for the down payment? Write a half-page, typed paper stating what ideas changed and why. If this project did not change the way you think, write how this project gave further evidence to support your existing opinion about buying a home. Be specific.

## Part VI: Extra Credit

1. Suppose you buy a car for $13,500 and you get a "zero down" loan at 5.9% interest for 5 years.

What is your monthly payment? $260.37

How much interest will you pay over the life of the loan? $2,121.93

What is the total cost of the car? $15,621.93

2. Contact a lending institution with the same information you did the first time with two exceptions. Tell them you have a 650 FICO and you're only interested in a 30 year fixed rate mortgage.

30 Year Interest Rate (650 FICO): 4.47%

Then complete the amortization schedule with the new rate. Record the total interest paid below.

Total Interest paid over 30 years: $176,548.20

Compare the total interest paid the same loan with a 750 FICO versus a 650 FICO. How much would a high FICO save on your loan?

High FICO savings: $10,077.42