

Name: Jared Hansen

Due date: Before Thanksgiving

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. PLEASE READ ALL OF THE INSTRUCTIONS.

50 x2

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: \$335,900

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: \$67,180

Mortgage Amount: \$268,720

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): 3.25% 15 Year Interest Rate (750 FICO): 2.75%

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 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.]

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

SHOW WORK HERE:

$$PMT = \frac{268,720 \left(\frac{.0325}{12} \right)}{1 - \left(1 + \left(\frac{.0325}{12} \right) \right)^{-12(30)}} = \frac{727.78}{.6023} = 1169.49$$

Monthly Payment for a 30 year mortgage = \$1169.49 ✓

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 summarizes 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 for 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.)

\$ 1169.49

b. Total Interest Paid Over 30 Years:

(This might be called "Cumulative Interest".)

\$ 152,295.11
6.4

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.)

\$ 42,015.11 ~~the~~
6.4

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.

Over time the principal increases and the interest payment decreases. This is because the loan balance is decreasing so the principal rises over the interest.

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

Pmt. No. 105

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.

SHOW WORK HERE:

$$\frac{1169.49}{.35} = \$3341.40$$

Minimum Monthly Take-Home Pay:

\$3341.40 ✓

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.

SHOW WORK HERE: $3341.40 / 3 = 1113.8$? ✓

$1113.80 + 3341.40 = 4455.20$ ✓

Minimum Monthly Gross Salary: \$ 4455.20 ✓

$4455.20 \cdot 0.75 = 3341.40$

11. Now compute the required Minimum Gross Annual Salary:

\$ 53,462.40 ✓

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.

SHOW WORK HERE:

$$PMT = \frac{268,720 \left(\frac{.0275}{12} \right)}{1 - \left(1 + \left(\frac{.0275}{12} \right) \right)^{-12(15)}} =$$

Monthly Payment for a 15 year mortgage = 1823.59 ✓

13. List the following information from the amortization schedule:

- a. Payment Amount: \$ 1823.59
(This should agree with what you computed in part 12.)
- b. Total Interest Paid Over 15 Years: \$ 59,526.57
(This might be called "Cumulative Interest".)
- c. Total Amount Repaid: \$ 328,246.57
(The schedule will not give you this number. See if you can figure out both ways to compute this.)

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: \$ 92,768.54

16. If you saved a significant amount of money, why do you think most people get a 30 year mortgage instead of a 15 year mortgage?

They may not have the income required to pay off payments without going in debt.

Part IV: IMPORTANCE OF HAVING A GOOD CREDIT SCORE

17. Contact a lending institution with the same information you did the first time with two exceptions. Tell them you have a 620 FICO and you're only interested in a 30 year fixed rate mortgage.

\$ 1,244.48

30 Year Interest Rate (620 FICO): 3.75%

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

Total Interest paid over 30 years: 179,294.32 ✓

19. Compare the total interest paid the same loan with a 750 FICO versus a 620 FICO. How much would a high FICO save on your loan?

High FICO savings: \$26,999.21 ✓

Part IV: Extra Principal Payments

20. 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?

315 payments (26.25 years) ✓

b. What is the total amount of interest paid over the life of the loan?

\$131,017.20 ✓

c. What is the total amount repaid over the life of the loan?

\$399,737.20 ✓

21. Compare the amount in 20 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?

421,015.11
- 399,737.20
21,277.91

\$21,277.91 ✓

Part V: Reflection

22. Write a half-page, well written, typed paper describing what you learned by doing this project and your feelings about buying a house. You may address issues such as: 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 for the down payment? How important is a good credit score?

Part VI: BONUS

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

23. What is your monthly payment? \$260.37

$$260.37 = \frac{13500 \left(\frac{.059}{12} \right)}{1 - \left(1 + \left(\frac{.059}{12} \right) \right)^{-12(5)}}$$

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

+3

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

Jared Hansen
Math 1050 - Cavin
Project 2 Reflection

Doing this project taught me a lot about loans, payments, and mortgages that confused me prior to completing the project. I was able to learn how to calculate monthly payments based on principal, annual interest rate, and the timespan of the loan. Using a Microsoft Excel spreadsheet to do calculations I was able to figure out the total interest that would have to be paid during the loan. One of the most beneficial thing that I learned from this was that based on how much my monthly payment is, I can use that to calculate the minimum net pay and gross pay that I will need to earn during the month.

Using the annual salary that I calculated, I can make sure that my choice of occupation will be able to cover my expenses. I decided that I will pay the largest amount of reasonable additional payments that I can because over time that will save me a lot of money and end my loan period much sooner than planned. When choosing my home I will be sure to pick one that is in a reasonable range and not require me to over work myself or get myself into debt. I plan to save for my down payment by saving at least 10-15% of all of my paychecks and putting it into a savings account with a good interest rate.

MLS# 1124101 Presented By: Leslie Fink 801-872-3465

List Price: \$335,900 **Tour/Open:** None
 Price Per: \$90 **Status:** Active
 CDOM: 10 **List Date:** 09/27/2012
 DOM: 10

Address: 1637 W HUNTERS CREEK CIR

NS/EW: 9575 S / 1637 W

Area: WJ; SJ; Rvrton;
Herriman; Bingh

City: South Jordan, UT 84095

County: Salt Lake

Restrictions: No

Proj/Subdiv: HUNTERS CREEK

Tax ID: 27-10-205-012

Taxes: \$2,500

Zoning: R1

HOA Fee: \$0

HOA Contact:

HOA Phone:

HOA Remarks:

Pre-Market:

School Dist: Jordan

Elem: South Jordan

Sr High: Bingham

Priv Schl:



Jr High: South Jordan
Other Schl:

Lvl	Approx Sq Ft	Bed Rms	Bath			Fam	Den	Formal Living Rm	Kitchen Dining			Laun dry	Fire place
			F	T	H				K	B	F		
4	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
2	334	0	0	0	0	1	0	0	0	0	0	0	0
1	1684	3	2	0	0	1	0	1	1	1	0	1	1
B	1709	0	0	0	0	0	0	0	0	0	0	0	0
Tot	3727	3	2	0	0	2	0	1	1	1	0	1	1

Roof: Asphalt Shingles

Heating: Forced Air

Air Cond: Central Air; Electric

Floor Cov: Carpet; Hardwood; Tile

Window Cov:

Pool Feat:

Possession: closing

Exterior: Brick; Stone; Stucco

Landscape:

Lot Facts: Cul-de-Sac; Fenced: Part; Terrain, Flat

Exterior Feat:

Interior Feat: Closet; Walk-In; Dishwasher, Built-In; Disposal; Gas Log; Jetted Tub; Range/Oven: Free Stndg.; Vaulted Ceilings; Granite Countertops

Amenities: Cable Tv Wired; Electric Dryer Hookup; Gas Dryer Hookup

Inclusions: Ceiling Fan; Microwave; Range

Exclusions:

Terms:

Storage: Basement

Tel Comm:

Access Feat:

Utilities: Gas: Connected; Power: Connected; Sewer: Connected; Sewer: Public; Water: Connected

Zoning: Single-Family

Driving Dir:

Remarks: Like brand new! Built in 2011! Great location on cul de sac. Large 3 car garage, granite tops, custom cabinetry, 2 tone paint, high efficiency furnace and insulation, gas fireplace, Grand master bath, Bonus room and More!.... Easy to show! call for appt.

Office: Keller Williams South Valley Realty

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Type: Single Family
Style: Rambler/Ranch
Year Built: 2011
Effect Yr Blt:
Deck | Pat: 0 | 1
Garage: 3
Carport: 0
Prkg Sp: 6
Fin Bsmt: 0%

Const Status: Blt./Standing
Acres: 0.25
Frontage: 90.0
Side: 120.0
Back: 90.0
Irregular: No

Basement: Full
Garage/Park: Attached; Opener
Driveway: Concrete
Water: See Remarks; Culinary; Irrigation
Water Shares:
Master Level: 1st floor
Senior Comm: No
Animals: