



Math in the House!!

100 pts

Buying a house will most likely be the biggest financial decision you will ever make. Recently, there have been enormous problems in the housing market. From houses sitting on the market for many months to homes being foreclosed on because the owners are not able to make the monthly mortgage payments, the housing market has been in a real slump. During the next two weeks, you will be using your knowledge of personal finance, housing, and research. This is a large part of your quarter grade-- worth **2 TEST GRADES**. The project will be broken into a few small steps that we will complete along the way. Hopefully at the end, you will have a better idea of the amount of money it takes to responsibly purchase a house, so that you can make a more informed decision when it comes time for you to buy your first home. The project will consist of the following parts:

Part 1: (screenshot needed)

Research a house you would like to own. This can be anything that is currently on the market. You can stay in the area, or go as far as you would like to go. I want, however, to see a house that would be “reasonable” for you to buy with the career you have chosen. For example, as a teacher, if I was looking for a “reasonable” home, I would NOT be looking at homes for \$400,000! There are a variety of resources online you can use to research homes that are on the market, including www.realtor.com, www.zillow.com, www.trulia.com, and any of the local realtors’ sites. Find a house that looks interesting and is reasonable! Take a screenshot and submit through Google Classroom. This is due on _____.

Part 2:

Most homes are financed for 15 or 30 years. Choose two types of loan from below, and research how these different types of loans work. Compare and contrast them, explain what they are, how they work, and any other important information.

Fixed Rate Mortgage

Adjustable Rate Mortgage (ARM)

Conventional

USDA Loan

FHA Loan

VA Loan

Bridge or Gap loan

THIS PORTION SHOULD BE IN YOUR FINAL WRITE-UP!!

Part 3 (Section 10.1 & 10.2):

Assume that you will put 20% down payment on your house and then borrow the remaining amount. Using the formulas we used in chapter 10 (see below), calculate the monthly payments on your house for two different loans, a 15-year fixed rate of 3.50% and a 30-year fixed rate of 4.12% . These are recent loan rates from Wells Fargo. **THIS PORTION SHOULD BE IN YOUR FINAL WRITE-UP!! All work must be shown.**

Needed formulas:

$$\text{Mortgage} = \text{Selling price} - \text{Down payment}$$

$$\text{Monthly Payment} = \frac{pr(1+r)^n}{(1+r)^n - 1}$$

where p = the amount of the mortgage

r = rate per payment (the rate divided by 12)

n = number of payments needed to pay off loan (# of year * 12)

Part 4 (Section 10.5 & 10.6):

Buying a house isn't that easy, though! Most homeowners are required to carry home insurance and pay property taxes, which are factored into monthly payments. Property tax is paid to your local municipality so they can provide things like education to school-aged residents, police and fire departments, parks and libraries. Each year you must pay a percentage of your property's value to help pay for these things. For this project, we will assume an **annual property tax rate of 2.3%** of your home's value. Home insurance rates can also vary depending on the location of your house and the amount of coverage you have, as we discussed in class. We will assume an annual rate of 0.325% of your house's value. Determine how much these two factors will add to your monthly payment and find the total amount you will have to pay each month (this is often called PITI, and acronym for Principal, Interest, Tax, and Insurance--in other words, find out the amount per year and divide by 12). **INCLUDE IN FINAL WRITE-UP!**

Part 5 (Section 10.2):

For both of the loans listed above, determine the total amount of interest, taxes, and insurance that you will pay over the life of the loan. Add together with principal & downpayment to get a total expense over the life of the mortgage. Insurance & taxes will actually vary over time, but we will assume the rates given above are constant for the life of the mortgage. **INCLUDE IN FINAL WRITE-UP!**

$$\text{Total P\&I} = \text{monthly payment(w/o taxes \& insurance)} * \text{\# of years} * 12 \text{ payments/year}$$

$$\text{Total Taxes} = \text{annual cost} * \text{number of years of mortgage}$$

$$\text{Total Insurance} = \text{annual cost} * \text{number of years of mortgage}$$

$$\text{Total paid over life of mortgage: Total P\&I} + \text{Total Taxes} + \text{Total Insurance} + \text{Down Payment}$$

Part 6:

Most lenders encourage the borrower to not exceed a monthly payment of 28% of borrower's gross monthly salary. In fact, banks will often turn down potential buyers if they feel the buyers are trying to purchase a house they cannot afford (part of the reason for the recent housing disaster is that banks were lending to people who were buying a more expensive house than they could afford). Using this 28% guideline, determine the amount of monthly salary you will need to earn in order to be accepted for a loan (again this is only an estimate some banks consider). Then, determine the annual salary needed to purchase the home. **INCLUDE IN FINAL WRITE-UP**

Part 7:

Suppose you decide to go with the 30-year option but can make additional payments of \$100 each month. Use this new payment to determine when the loan would be paid off and how much money you would save compared to making the minimum payment. For this part of the project, ignore the taxes and insurance. Use the amortization tables at Bankrate.com. Compare the differences. How does this affect the term of the loan, and be mathematically specific? For example, how many payments would it cut? How much interest would you save? **THIS SHOULD BE IN FINAL WRITE-UP.**

Part 8:

Write a 2-page (full two page **minimum**) essay discussing the things you learned about while completing the project. Reflect upon which loan you think would be best for you. This should also include an overview of your calculations and the amortization table. Please type this portion. **Make shure too speel ckeck and proff reed bee four ewe turn it inn.** There will be a blank Google doc in Classroom for you. **You must use 12 point font, not bold, standard margins, double spacing.**

Part 9:

Turn all into Classroom except for handwritten work. Turn this into box. The entire project is due _____ . ***If any part of the project is turned in late***, the entire project is late, and you will lose 10% per day

Name _____

Due _____: Find House

Part 1: Screenshot of house you will be studying. Turned into Classroom. _____/4 pts

Due _____: Preliminary Calculations
(all handwritten calculations must be handed in; label each section)

Part 3: Monthly payments for both loans _____/8 pts

Part 4: Total monthly payment (PITI) for both loans _____/8 pts

Due _____: Final Draft and Written Portion (Part 10)
Make sure you include all below in your write-up. Turned into
Classroom on the Doc or Sheet sent to you.

Part 3: Monthly payments for both loans _____/4 pts

Part 4: Total monthly payment (PITI) for both loans _____/4 pts

Part 5: Total amount paid during the life of both loans
including tax & insurance. _____/8 pts

Part 6: Annual and monthly salary needed for both loans _____/8 pts

Part 7: When the 30-year loan would be paid off with additional \$100
and how much you save. _____/4 pts

Part 2: Discussion of different loan types _____/8 pts

Part 9: Essay, including summary of calculations and reflections
(grammar & spelling ARE being graded, too!). _____/30 pts

All handwritten math calculations included in paper _____/4 pts

Part 9: Final project neatness (5 pts) and organization (5 pts) _____/10 pts

Total: _____/100 pts.