



## MATH 140: WEEK-IN-REVIEW 13 (CHAPTER 6.2)

1. If Peter deposits \$100 at the end of each month into a savings account earning interest at a rate of 5.65% per year compounded monthly, how much will he have at the end of 20 years (assuming no deposits or withdrawals are made during that period)? How much total interest will he have earned?



2. You wish to retire with \$1,000,000 in a retirement account, which you will make equal monthly deposits during the 45 years that you work. If the account will pay interest at a rate of 6.25% per year compounded monthly, how much should you deposit at the end of each month in order to have your million?



3. You are looking to buy a new car and have only \$1,250 for a down payment. The car you wish to buy has a purchase price of \$25,500. If the best financing option you find charges interest at a rate of 3.25% per year compounded monthly, how much should you pay each month in order to pay off the car in 60 months, assuming you use the money you already have for a down payment? In 48 months? In 36 months? How much do you end up paying in interest with each of these options?



4. How much should you deposit at the end of each quarter into an account earning interest at an annual rate of 4.25%, compounded quarterly, in order to have \$45,000 at the end of 5 years?
5. You were given \$1,000 at your college graduation party. You decide to deposit the entire amount into an account earning interest at an annual interest rate of 3.75%, compounded monthly, on your first day of work. From each paycheck of your new job, you deposit \$100 at the end of each month into the same account. If you continue making these deposits and do not withdraw any money from the account, how much money will be in the account after 15 years? How much total interest does the account earn?



6. You go on a shopping spree and use a credit card which charges interest at an annual rate of 24% compounded monthly. If you make no additional charges to the card, your required monthly payment will be \$101 for 233 months.

(a) How much did you charge (to the nearest dollar)?

(b) How much total interest will you end up paying?



7. Fiona recently purchased a car by making a \$2,000 down payment and securing a loan for the remaining amount which charges interest at a rate of 4.5%, compounded monthly, and requires monthly payments of \$375 over 5 years. What was the purchase price of Fiona's car?



8. Ten years ago, Jonas made a down payment on a house of 20% of the purchase price and secured a bank loan of \$175,000 to finance the remaining amount. The mortgage was for a term of 30 years, with an interest rate of 7.5% per year compounded monthly on the unpaid balance to be amortized through equal monthly payments.

(a) What was the purchase price (cash value) of Jonas's house?

(b) How much does Jonas pay per month towards the mortgage?



(c) What is the outstanding principal on Jonas's house now?

(d) How much equity does Jonas have in the house now?

(e) How much total interest will Jonas pay over the life of the loan?





(f) At this time, interest rates have dropped to 5.2% per year compounded monthly on a 15 year mortgage and Jonas is thinking about refinancing. If he refinances, what will his new monthly payments be?

(g) How much money, if any, will Jonas save by refinancing (assuming no additional refinancing costs)?



9. Eugenia buys a new \$1,500 television by paying 15% down payment and financing the remaining amount. The terms of her finance agreement state that the unpaid balance will be charged interest at a rate of 18% per year, compounded monthly, and the money is to be repaid over a period of 20 months with equal installments made at the end of each month.

(a) How much will Eugenia pay each month?

(b) How much of the first payment goes towards paying down the loan?



(c) Fill in the first six lines of the amortization schedule.

End of Period	PMTs remaining	Payment (PMT)	TO Interest	TO Principal	Outstanding Principal	EQUITY
0						
1						
2						
3						
4						
5						

(d) How much equity will Eugenia have in her TV after 1 year?



10. Matt bought a new house in 2005 for \$150,000. He put 20% down and financed the remaining balance with a 30 year mortgage at an annual interest rate of 5.58%, compounded monthly, on the unpaid balance.

(a) What were Matt's required monthly mortgage payments when he bought the house?

(b) How much of his first payment went towards interest? How much of his first payment went towards the principal?

(c) In 2010, after 5 years, Matt decided to refinance his house with a 25-year mortgage with an annual interest rate of 3.5%, compounded monthly, on the unpaid balance. What are his new required monthly payments?



(d) Before refinancing, how much equity did Matt have in his house?