

**Math 141 Week in Review**  
**Week 10 Problem Set**

1. When you are 7, your grandmother gives you \$20 for your birthday, which you deposit in a savings account that earns interest at a simple interest rate of 8.5% per year. Your goal is to have \$100 in the account with which to buy a Gameboy. How long will it take to have \$100 in the account?
2. You don't want to wait, so you open a different bank account with a better simple interest rate of 11% per year. If you want to have \$100 in 2 years, how much should you invest in this new account?
3. Your grandmother will never give you that much money, so you change accounts again. This time you start your account with \$30 (you have a little extra from doing chores) and you just leave it there for a while. In 5 years, you have \$52.50 in your account. What was the simple interest rate on the account?
4. So now you are 12 years old and somewhat wiser. You decide that simple interest rates aren't doing the job. So you take your \$52.50 and put it in a savings account that earns interest at a rate of 9% per year compounded quarterly.
  - A. How much will you have at the end of 3 years?
  - B. What must the interest rate be if you want to have \$75 at the end of the 3 years? (Interest is still compounded quarterly. Round to 4 decimal places.)
5. After 10th grade, you get a part time job. Every week you deposit \$40 from your paycheck into a savings account earning an interest rate of 8.65% per year compounded weekly. In how many years will you have \$3500 in this account?
6. When you graduate from high school, you decide to take \$1000 of your money and open a checking account. You have three banks from which to choose. Fourth National Bank offers an account with an interest rate of 9.44% per year compounded monthly. Sixth Bank of Texas offers an account with an interest rate of 9.53% per year compounded weekly. Seventh American Bank offers an account with an interest rate of 9.61% per year compounded semiannually. Which account should you choose?
7. If you invested your original \$1000 into an account with interest compounded continuously at a rate of 9.88% per year, how much would be in the account after 4 years?

8. Now that you are starting college, you will need a computer. You make a down payment of \$200 and take out a loan on the remaining balance. Your payments are \$55 per month for 2 years at an interest rate of 10% per year compounded monthly.
- A. What was the cash price of the computer?
  - B. How much will you pay in interest in total?
9. You are planning for the near future. In 4 years, you want to take a post-graduation vacation to New York City. You know you will need \$4200 for this vacation.
- A. How much should you deposit now into an account earning 11% per year compounded monthly to have enough for the trip?
  - B. How much should you deposit each month into a sinking fund set up for this purpose if the account earns interest at a rate of 11% per year compounded monthly.
  - C. How much of the \$4200 is from interest earned in each of **A** and **B**?
10. You make a foolish purchase while in college. You buy an HDTV using a credit card. The TV costs \$2000. The credit card charges an interest rate of 17% per year compounded monthly. After 1 month, you get your first credit card bill. The statement suggests that you make the minimum payment of \$75.
- A. If your first payment is \$75, how much goes toward interest?
  - B. How much of the payment goes toward the principal?
  - C. If you continue to make a payment of \$75 each month, how long will it take to pay off the TV?
  - D. How much interest will you pay in total?
  - E. If you decide to pay off the TV in 18 months, how much should your monthly payment be?

- 11.** Once you've graduated, you look for a job and need a car to get to all your many interviews. The car costs \$24,000. You make a 5% down payment and take out a 4-year loan on the balance at 9% interest per year compounded monthly. Complete the first and last three rows of the amortization table for your loan.

End of Period	Payments Remaining	Payment	Amount Towards Interest	Amount Towards Principal	Outstanding Principal	Equity
0	48					
1	47					
2	46					
...						
46	2					
47	1					
48	0					

- 12.** Once you have landed a great job, you start saving for retirement to prepare for the long-term future. Every month you deposit \$325 from your paycheck into an account that earns interest at a rate of 5.5% per year compounded monthly.
- A.** How much money will be in the account when you retire in 50 years?
  - B.** How much interest will you have earned in total?
  - C.** How much money would be in the account if you deposit the same amount of money, but begin only 40 years before retirement? How much interest will you have earned in total?
  - D.** 25 years before retirement? Total interest?
- 13.** Next, you buy a house for \$240,000. You make a 10% down payment and take out a loan on the remaining balance. The mortgage loan is for 30 years at an interest rate of 6.75% per year compounded monthly.
- A.** How much will the monthly mortgage payment be?
  - B.** How much of the first payment is interest?
  - C.** Once the mortgage is paid off, how much will you have paid in interest?

- 14.** After 8 years, you refinance your home. The new loan on the remaining balance is to be paid off over 20 years and has an interest rate of 6.05% per year compounded monthly.
- A.** What is the outstanding principal after the 8 years?
  - B.** How much equity do you have after 8 years?
  - C.** What is the new monthly mortgage payment?
  - D.** How much total interest do you save by refinancing?