

**Instructions:** Work problems on a separate sheet of paper and attach work to this page. You should show all work to receive full credit for problems. Questions with compact answers can be recorded directly on this page. Graphs and longer answers that won't fit here, indicate which page of the work the answer can be found on and be sure to clearly indicate it on the attached pages. You may use Excel to complete the problems, but then submit Excel files online.

1. A product is listed for wholesale at \$100. It's sold to a supplier with a 20% mark-up, and then resold to a customer with an additional 50% mark-up. How much has the item been marked up from the wholesale cost?
2. A product is originally marked for retail at \$75. It's offered at a 30% discount, and then after a while, at an additional 40% discount. What is the final discounted price, and how big a discount is this?
3. Use the results of the previous two problems to explain why you can just add percent increases and decreases.
4. Give an example of the misuse of percentages in real life.
5. You borrow \$2000 at a simple interest rate of 13% for two years. How much money do you owe at the end of the two years?
6. You borrow \$7500 for a new car at 4.5% interest compounded monthly for 4 years. What is your monthly payment on the car?
7. You invest \$300 in a savings account earning 1.5% compounded daily for 10 years. How much money is in the account at the end of that time if you add nothing else to the account? Compare the result to continuous compounding. How different is the result?
8. You want to borrow money for a home loan of \$150,000. Suppose that one bank (A) says they will charge you 7.5% compounded quarterly for 15 years, and another bank (B) says they will charge you 7.25% for thirty years compounded weekly. How much is the monthly payment in each case? [Hint: first you will calculate quarterly or weekly payments and combine or divide from there.] How much total interest is paid on each loan? Which one do you prefer? Explain.
9. Suppose to you decide to invest \$4000 each year in the stock market, and plan to keep investing the same amount every year. If the value of the stock market is going up at 10% per year, how much money will you have in the account after 10 years?
10. If you want \$20,000 to buy a house in 5 years, how much money do you have to deposit each month to achieve that goal if you can only earn 2.5% interest on your savings?
11. Find the effective rate of the following scenarios.
  - a. 2% compounded monthly
  - b. 5% compounded daily
  - c. 9% compounded weekly

12. Assume you have the following information from a credit card statement:

- APR = 13.52%
- Number of days in the billing cycle: 30
- Average Daily Balance: \$2547.93
- Previous Balance: \$2784.22
- Purchases this month: \$145.78
- Payments made this month: \$450.00

a. Calculate the Finance Charge.

b. What is the new balance?

13. Determine if the sequences represent exponential growth.

- 1.75, 2.5, 4, 7, 12, 25, 49, ...
- 0.32, 0.8, 2, 5, 12.5, 31.25, ...
- 9, 4, 1, 0, 1, 4, 9, 16, 25, ...
- 5, -2, 1, 4, 7, 10, 13, ...
- 0.4, 0.8, 1.6, 3.2, 6.4, 12.8, 25.6, ...