Math 17: Exercise Set 5 – Posted 10/15

****Round your answers to two decimal places. To help out, the types of problems are marked in bold.****

10.1: Percentages

This should be review. Use the formula $F = (1 + p)B$ where F is the final price, B is the base price, and p is the percentage increase (or tax). Rearranging we get, $p = (F/B) - 1$.

1. A pair of earrings cost \$60 before tax. What is the final price after a sales tax of 6%? **(price after tax)**
2. Michael's tuition bill for last year was $\$15,236$. This year his tuition bill increased to $\$16,000$. What was the percentage increase on his tuition? **(percent change)**
3. Stock in company XYZ decreased from \$13 a share to \$9 a share. What was the percentage decrease in stock price? **(percent change)**
4. You stock portfolio goes up 25% one day and goes down 20% the next day, what is the net percentage change in the value of your stock portfolio? *Hint*: the answer is not +5%. **(net percent change)**
5. For three consecutive years the cost of gasoline increased by $8\%, 15\%$, and 20%, respectively. What was the overall percentage increase of the cost of gasoline during the three-year period? *Hint*: the answeer is not +43%. **(net percent change)**

10.2: Simple Interest

Remember the simple interest formulas $I = Prt$ and $F = P + I = P + Prt = P(1 + rt)$ where F is the future value, P is principal value, r is the rate (APR expressed as a decimal) and t is the term of the loan.

1. Suppose you have \$3000 in a trust fund which has an APR of 3%. What is the interest you will have accumulated after 5 years? **(interest)**
2. Suppose you borrow \$875 for a term of four years at simple interest and 4.28% APR. How much is the total (principal plus interest) you must pay back on the loan? **(final value)**
3. Suppose you purchase a four-year bond with an APR of 5.75%. The face value of the bond is \$4920. Find the purchase price of the bond. **(purchase price)**
4. Suppose you purchase a seven-year bond for \$5000. The face value of the bond is \$8250. Find the APR. **(rate)**

5. Find the APR of a bond that doubles its value in 20 years. **(rate of price doubling)**.

10.3: Compound Interest

Remember the compound interest formula $F = P(1 + r)^t$.

1. Find the future value of an investment of \$3250 compounded annually with a 9% APR for a term of four years. **(annual compounding - final value)**

2. Between 1990 and 2010 the average annual inflation rate was 3.5%. Find the salary in 2010 dollars that would be equivalent to a $25,000$ salary in 1990. **(annual compounding - final value)**

3. Consider a CD paying a 3.6% APR compounded monthly. Find the periodic interest rate and then use it to calculate the future value of the CD assuming you invest \$3250 for four years. **(general compounding - rate & final value)**

4. Consider a CD paying a 3.65% APR compounded daily. Find the periodic interest rate. **(general compounding - rate)**