(1) For the following problem assume exponential growth/decay.

A) If oil is being consumed at the rate of 2.3% per year, how long does it take to consume one half of all present oil reserves?

B) How long will it take to deplete 90% of all the reserves?

(2) If the population of metropolitan Salt Lake City in 2009 is 300,000, and it was 250,000 in 1995, what is the growth rate for the time period, assuming exponential growth?
For each of the following word problems below, name the formula or formulas you would use to solve it.

Do not solve the word problems – Each formula may be used more than once

A) The Bryan Landscaping Company earned $10,000 in its first year of business which it deposited in a cd account earning 6% compounded daily for 4 years. What is the value of this account after the four year period.

Formula(s):

B) How much more interest will be earned if $10,000 is invested for 8 years at 6% compounded continuously, instead of 6% compounded quarterly?

Formula(s):

C) Baliwood Pictures Inc., with movie studios in New Delhi, India, has taken out a loan in order to finance its latest heart-tug picture. The loan is for $7.2 million. The terms are 6% interest over a 5-year period. Compounding and payments will be made quarterly. What will the payment be?

Formula(s):

D) Jasmine wants to be a contestant on the TV game show “The Greatest Race.” In order to train, get in shape and participate in the game show, she will need to set up a fund. She calculates that she can just survive on withdrawing $1,000 every month for two years. How much money will Jasmine need if the fund pays 4.75%, compounded monthly.

Formula(s):
E) Hector has saved $8,000 from his tips over the last year. If he invests it in an account paying 11% simple interest, how long will it take to be worth $13,000?

**Formula(s):**

F) Scott will be forced into retirement because of his incompetent work habits. He would like to have a retirement fund from which he can withdraw $30,000 a year for 20 years. How much money needs to be in Scott's retirement account if it earns 6.5% interest compounded monthly? He will withdraw money from his account monthly at the beginning of the month.

**Formula(s):**

G) Julie can sell her dirty socks on Ebay. If she deposits the money she earns at the end of the month into an annuity for 3 years at 7% simple interest, compounded monthly. How much must she deposit each month so that the account is worth $1996.50 in three years.

**Formula(s):**

H) Beth wants to save for her son's college education. Andrew, Beth's son, wants to attend an expensive private college. She deposits her enter $15,000 annual bonus into an account that earns 6.2% interest compounded yearly on January 1st every year for 12 years. How much money will Andrew have for college?

**Formula(s):**
I) You have three credit card options: Church of the Holy Shrine credit card that charges 12% simple interest, the Pawn Broker that charges 21.5% interest compounded daily, or the We Gocha card that charges 8.5% compounded monthly. Which card will cost you the least interest per year?

**Formula(s):**

J) Piano by Wendy is a piano retailer who has been working out of a home in Layton, Utah. Business has been so brisk lately that she has decided to open a store in Roy. She wishes to have a store built and will finance the construction cost of $750,000. The interest rate on the loan is 7.5% compounded monthly for a 5 year period. After 2 years of payments, Wendy's business is doing so well she decides to pay off the remainder of her loan early. How much does she have to pay the bank to end her loan?

**Formula(s):**

K) Rubin-the-Dog's owner wants to bury Rubin in style -he was such a good dog. So, he sets up an annuity in Rubin's name, in which he deposits $100 a month at the end of the month for 4 years at 5% interest, compounded monthly. What will the value of Rubin's funeral annuity be in 4 years?

**Formula(s):**

L) Aunt Brenda decides she wants to pay for her niece, Kristen, to get a college education. She is going to put one lump sum payment into an account earning 4.8% interest compounded monthly, when Kristen completes Kindergarten. Brenda wants the money to provide payments of $1,000 every month for five years, starting when Kristen graduates high school. How much money does Aunt Brenda need to deposit to achieve her goal?

**Formula(s):**
M) The Tennessee Valley Authority (TVA) has arranged to borrow $650 million for the U.S. Treasury to finance a new dam to provide water and power to the farmers of Tennessee Valley. The interest rate is 4.2% for a 30 year term. Payments are made to the treasury at the end of the year and compounding is computed annually. Calculate the annual payment amount. What is the total amount of interest paid by the TVA to the U.S. Treasury?

Formula(s):
Choose 4 of the problems above and find the solution

Instructions:

For each choice indicate the problem letter clearly in the space provided.

i. Write down the formula(s) you are going to use to solve the problem.

ii. Make a list of of the variables in the formula and fill in the values given in the problem (i.e. R = $5000, r = 0.06 etc)

iii. Solve the problem using your calculator

Grading:

• i – iii will be weighted evenly.
• I will only grade 4 problems – working extra problems will not help you

4) Problem Choice _______

i. Formula(s):

ii. Variables and Values:

iii. Solution: ________________________________
5) Problem Choice ______

i. Formula(s):

ii. Variables and Values:

iii. Solution: ________________________________

6) Problem Choice ______

i. Formula(s):

ii. Variables and Values:

iii. Solution: ________________________________
7) Problem Choice _______

   i. Formula(s): 

   ii. Variables and Values: 

   iii. Solution: ________________________________