Exponential Growth and Decay Problems 3 Name

1) On January 1, 1999, the price of gasoline was 1.39 per gallon. If the price of gasoline increased by 0.5% per month, what was the cost of one gallon of gasoline, to the nearest cent, on January 1 one year later?

2) The height of a bouncing ball (measured in inches) after x bounces is represented by the equation $f(x) = 120(0.75)^x$. About how many times higher is the first bounce than the fifth bounce?

3) A new \$26,000 car depreciates by 12% every year.

- a) Write an equation that shows the cost of the car, y, at year x.
- b) How much will the car be worth in 6 years?
- c) How long will it take for the car to be worth less than \$100?
- d) Some people buy used cars so that the value of the car doesn't depreciate so quickly. Does this make sense? Explain your thinking.

4) The Franklins inherited \$15,000, which they want to invest for their child's future college expenses. If they invest it at 3.25% with interest compounded monthly, determine the value of the account, in

$$y = a(1 + \frac{r}{n})^{nx}$$

dollars, after 5 years. Use the formula n where y = value of the investment after x years, a = initial value (principal invested), r = annual interest rate, and n = number of times compounded per year.

5) You invest \$10,000 in an account with 1.250% interest, compounded quarterly. Assume you don't touch the money or add money other than the earned interest.

a) Write an equation that gives the amount of money, y, in the account after x years.

b) How much money will you have in the account after 10 years?

c) How much money will you have in the account after 25 years?