Name: _____

6.REV.2 – End of Exponentials Review

Date: _____ Period: _____

1. Which function(s) have a value of $b > 1$?

2. Which function(s) have the smallest initial value?

3. Which function increases at the slowest rate?

4. Which function has the greatest value of b?

5. Which function(s) represent exponential decay?

6. Which function is decaying at the fastest rate?

7. Let $P(t) = 1200(1.045)^t$ represent the population of Brighton, where t represents the years since 2003.

   a. At what percent rate is Brighton's population increasing?

   b. Evaluate <u>and</u> interpret $P(15)$.
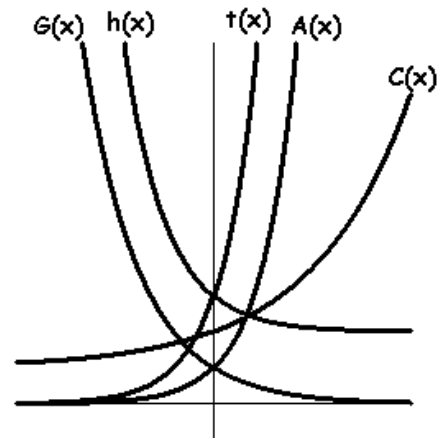
8. Each of the functions in the table below is increasing, but each increases in a different way. One is linear, one is exponential, and one is neither. Which is which? What is the linear function's rate of change? What is the exponential function's change factor?

t	$f(t)$	$g(t)$	$h(t)$
1	13.66	12.5	56.5
2	14.76	22.5	63.28
3	15.86	31.5	70.874
4	16.96	39.5	79.3784
5	18.06	46.5	88.9038

9. At the start of a study, the size of a particular animal population was 5000. Write a function formula for the size of an animal population, P, in t years since the start of the study.

   a. Rising at a rate of 2.8% annually.

   b. Diminishing at a continuous rate of 17%.

   c. Declining at a yearly rate of 11%.

   d. Escalating at a continuous rate of 20%.

   e. Lessening at a constant rate of 300 animals every 52 weeks.

   f. Climbing at a steady rate of 50 animals every twelve months.

10. Kryptonite decays at an annual rate of 11.4% per year. The initial amount of Kryptonite is 200 grams.

    a. Write an exponential function formula that represents the remaining amount, A, as a function of the time, t, in years.

    b. Predict how much Kryptonite is remaining in 10 years.

11. In the year 2004, a total of 3.9 million people traveled on Disney Cruise lines. The industry has been growing at approximately 7% per year. Write an exponential function formula that represents the number of people, P, as a function of the time, t, in years since 2004.

12. In a typical can of Code Red Mountain Dew there is approximately 475 milligrams of caffeine. Each hour the body metabolizes and eliminates 14.5% of the caffeine. Write an exponential function formula that represents the amount of caffeine remaining, C, as a function of the time, t, in hours.

13. Sales of energy-efficient compact fluorescent lamps in China have been growing exponentially. In 1994, the sales were $20 million and in 2003 they had increased to $440 million. What is the percent growth rate?

14. Theophylline is a common asthma drug. The concentration of theophylline in the blood stream is 10 milligrams/liter one hour after injection. After 9 hours, the concentration is 2.5 mg/l. Write an exponential function formula that represents the concentration, C, as a function of the time, t, in hours. *Round the b value to 3 decimal places and the a value to 2 decimal places.*

15. Consider the exponential function $Q(t) = 3(0.854)^t + 2$ and identify the following characteristics:

y-intercept	Horizontal asymptote	Increasing or decreasing?	Range	$\lim\limits_{t \to -\infty} Q(t)$	$\lim\limits_{t \to \infty} Q(t)$

16. What are the nominal and effective annual rates of a money market account that pays interest at the rate of 6% per year and is compounded daily? *Round the effective rate to three decimal places.*

17. Find the effective annual rate if $2500 is deposited at 5.3% annual interest compounded continuously. *Round the effective rate to three decimal places.*

18. In 1999, the population of Metropolis was 7.4 million and growing at a constant percentage rate.

    a. If there is an annual growth rate of 5.6%, what will the population be in 2024?

    b. If there is a continuous growth rate of 5.6%, what will the population be in 2024?

Chapter 6: Exponential & Logarithmic Functions