Name:_____Period:__ **Exponential/Logarithm Review for Final 2015**

Determine whether each equation represents exponential growth or decay.

1. $y = 72(1.6)^x$ **2.** $y = 7\left(\frac{2}{3}\right)^x$ **3.** $y = 24(0.8)^x$

For each function, find the annual percent increase or decrease that the function models

4. $y = 1700(0.75)^x$ **5.** $y = 30\left(\frac{5}{8}\right)^x$ **6.** $y = 984(1.73)^x$

For each function, find the growth/decay factor that the function models

7. +45% **8.** −10% **9.** +200%

10. The bear population increases at a rate of 2% per year. There are 1573 bear this year. Write a function that models the bear population. How many bears will there be in 10 years?

11. A new car that sells for $18,000 depreciates 25% each year. Write a function that models the value of the car. Find the value of the car after 4 yr.

12. Sr-85 is used in bone scans. It has a half-life of 64.9 days. Write the exponential decay function for an 8-mg sample. Find the amount remaining after 100 days.

13. **Find the amount in a continuously compounded account for the given conditions.**
principal: $5000
annual interest rate: 4.9%
time: 30 years

14. Suppose you invest $5000 at an annual interest of 5.7%, compounded monthly.
a. How much will you have in the account after 10 years?

b. Determine how much more you would have if the interest were compounded continuously.

Simplify each expression

15. $\log_2 32$

16. $\log_{12}\left(\frac{1}{144}\right)$

17. $\log 10$

18. $\ln e$

Write each logarithm expression as a single logarithm.

19. $\log_5 4 + \log_5 3$

20. $\log_6 25 - \log_6 5$

21. $\log_4 20 - 3\log_4 x$

Solve

22. The streptococci bacteria population N at time t (in months) is given by $N = N_0 e^{2t}$ where N_0 is the initial population. If the initial population was 100, how long does it take for the population to reach one million?

23. The population of Metrocity is 123,000 and is decreasing by 2.4% each year.
a) Express the population P of Metrocity as a function of time t.

b) How many people will be in Metrocity in 15 years?

c) When will there be 50,000 people in Metrocity?