Day 3 Exponential Word Problems and Review

Name______ Hour_____

1. Connor bought a car for \$2,500. It depreciates each year by 30% so the car is only worth _____% of the original price. How much will the car be worth in 7 years? $y = ab^x$

2. If there are initially 3500 bacteria in a culture, and the number of bacteria double each hour, the number N of bacteria after *t* hours can be found using the formula $N = 3500(2)^t$. How many bacteria will be present after 4 hours?

3. You put \$1,000 in the bank that has an annual interest rate of 5.5% that is compounded continuously. What will the balance be in 25 years if you just keep it in there? $A = Pe^{rt}$

4. Your little brother starts a savings account with \$50. His interest rate is 7% annually and is compounded semi-annually. How much will be in the savings account in 30 years? $A = P\left(1 + \frac{r}{n}\right)^{nt}$

5. The population P of 220 animals decreasing can be represented by the model $P = 220(0.81)^t$, where t is the number of years.

a. Estimate the number of animals remaining after 4 years.

- b. Estimate the number of animal remaining after 6 years.
- c. What happens to the population of animals after 40 years?



Decide whether the following functions are exponential growth or exponential decay.

8.
$$y = 0.2(3)^x$$

9. $y = 4\left(\frac{1}{5}\right)^x$
10. $y = 3\left(\frac{2}{3}\right)^{-x}$

11.
$$y = 0.8(1.02)^x$$
 12. $y = \left(\frac{5}{2}\right)^{-x}$ **13.** $y = 16(0.96)^x$

Use the rules of exponents to simplify.

14.
$$\frac{9e^2}{6e^x}$$
 15. $(3e^{5x})^4$ 16. $7e^4 \cdot 2e^{10}$