CCI Exponents Review

1. A boat costs $15,500 and decreases in value by 10% per year. How much will the boat be worth after 5 years?
   a. $9,152.6
   b. $15,450
   c. $8,237.34
   d. $24,962.91

2. In the last ten years, a company's gross income has risen at an annual rate of 40%. If the gross income at the beginning of the period was 0.2 million dollars, which formula can be used to estimate the income I in millions of dollars during the period, where t is the number of years since the beginning of the period?
   a. $I = 0.2(0.4)^t$
   b. $I = 0.2(40)^t$
   c. $I = (0.2 \times 1.4)^t$
   d. $I = 0.2(1.4)^t$

3. The change of a quantity after x years can be modeled by the function $y = 200(0.98)^x$. Which describes how the quantity changes each year?
   a. It is growing at an annual rate of 98%.
   b. It is growing at an annual rate of 0.98%.
   c. It is decreasing by 98 % each year.
   d. It is decreasing at an annual rate of 2%.

4. Suppose a population of 250 crickets doubles in size every 6 months. How many crickets will there be after 2 years? (MAKE A TABLE--be careful about months vs. years)
   a. 4,000 crickets
   b. 6,000 crickets
   c. 2,000 crickets
   d. 1,000 crickets

5. Use a pattern to find the next number. –164, –82, –41, –20.5, . . .
   What is the pattern?
   a. –82
   b. 2
   c. $\dfrac{1}{2}$
   d. 82

6. A cell culture increases by 1/2 every 5 minutes. If the culture contains 16 cells to start with, what is the total number of cells after 15 minutes? (Hint: Make a table to solve.)
   a. 54
   b. 81
   c. 24
   d. 36

7. Determine the amount of an investment if $5000 is invested at an interest rate of 4.5% compounded monthly for 10 years. Round your answer to the nearest whole dollar.
   a. $5429
   b. $7834
   c. $2834
   d. $5022

8. A piece of machinery valued at $2500 depreciates at a steady rate of 10% yearly. The owner of the business plans to replace the equipment when its value has depreciated to under $500. In how many years will the equipment be replaced? (experiment with time in your calculator!)

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9. The function $f(x) = 3(2)^x$ was replaced with $f(x)+k$, resulting in the function graphed below.
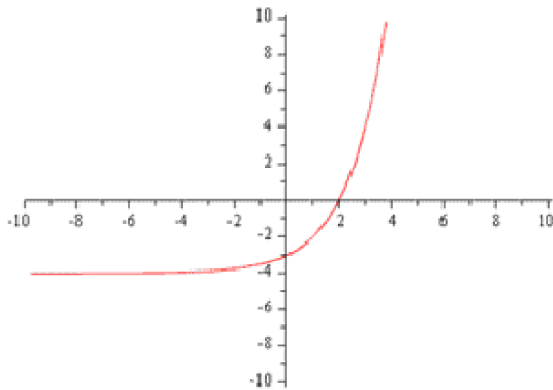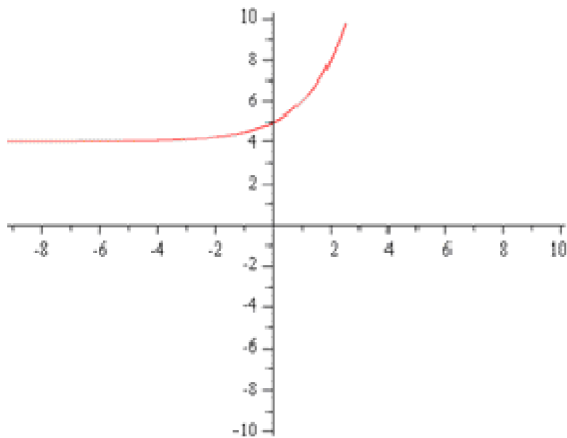

    What is the y-intercept of the original function?
    _____
    What is the translation k? _____

10. The function $f(x) = (2)^x$ was replaced with $f(x)+k$, resulting in the function graphed below.

    What is the y-intercept of the original function?
    _____
    What is the translation k? _____

11. The enrollment at Alpha-Beta School District has been declining 3% each year from 1994 to 2000. If the enrollment in 1994 was 2583, find the 2000 enrollment.

12. If there are initially 3500 bacteria in a culture, and the number of bacteria double each hour, the number of bacteria after t hours can be found using the formula $N = 3500\left(2^t\right)$. How long will it take the culture to grow to 35,000 bacteria?

13. Determine the amount of an investment if $100 is invested at an interest rate of 5% compounded monthly for 5 years. Round your answer to the nearest whole dollar.

14. What is the amount earned in the situation with $2,400 principal earning 2%, compounded annually, after 7 years?

15. Determine if the data in each table is exponential or linear. Write the equation/function rule.

x	0	1	2	3
y	2	6	18	54

    Exponential/Linear _____
    Equation/function rule: _____
    What is the Common Ratio?_____
    What is the Next-Now equation? _____