Test Practice Part Duex   Name _____
Exponentials and Logarithms

Show all work and circle final answer.

1. In 2026, there will be a population of 25,321 deer because of the explosion in the coyote population. Now (2017) there are 56,576 deer around looking like bambi. What is the annual decay rate for this population?

2. Find the inverse of the function, $f(x) = 3(4^{3x-1})$.

3. What is the solution of $7^{x+2} = 17$?

4. $f(x) = 2^x - 7$ and $g(x) = 2^x + 2$ can be written as $f(x) + k$, what is the value of k?

5. Rancher Rob runs Summer's ranch because she is a very important person and cannot do the day to day operations. He had 13,000 cattle in 2002. By 2008, he grew the herd to 25,540. The great and generous Summer pays him a bonus each year based on the amount of cattle. In 2020, the bonus will be 12%. If Rob has a yearly salary of $75,000, what will be his total income for 2020?

6. Solve $8^x = 32^{2x-4}$.

7. Find the inverse of the function, $y = 7e^{x-1}$.

8. What transformations are used to move $f(x) = (4^{x-2}) + 5$ if the parent function is $g(x) = 4^x$?

9. If you invest $5,000 in an account paying 7.3% compounded continuously, how long will it take for your investment to double?

10. Find the inverse of the function, $y = \log_7(x + 6) - 2$.

11. What is the domain and range of $f(x) = 2^{x+3} - 7$?

12. What is the exponential function that is represented by the logarithmic function, $\log_8 w(z) = 5z + 6$?

13. Find the inverse function of $h(x) = \ln(7x) + 1$.

14. Taliya has a savings account at Sartain Bank International that pays 6.7% yearly interest compounded yearly. What is the approximate equivalent monthly interest rate, compounded monthly?

15. If you deposit some money in an account that pays 4.2% interest compounded monthly. In eight years you have $75,000. What was your initial deposit?

16. A town has a population of 321,765 in 2017. Its population has been on the decline since its monarch, Queen Sartain the Sarcastic, has declared cell phones illegal. The decline can be modeled by the function $P(t) = 321,765e^{-1.6t}$. In what year will the population be one fifth the initial amount?

17. What is the solution to the equation, $5(2)^{4x+3} = 85$?