

Math 105 - Homework 10

Name: _____

1. Solve for y in the equation $\ln(y) = x + 5$.
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2. If $f(x) = \log_2(x)$ and $g(y) = 3^y + 5$, then find $f(g(1))$ and $g(f(1))$.
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3. The intensity of sound is measured in decibels. The function for calculating decibels is

$$D = 10 \log_{10}(P)$$

where P is the power of the sound in watts. How many decibels is a sound that is 100 watts?

4. Find the inverse of the decibel function above. Explain in words what the inverse function computes.
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5. The power of a sound depends on how far away you are away from the source of the sound. The formula for power is

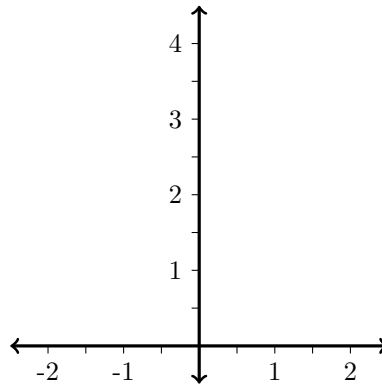
$$P(x) = \frac{C}{x^2}$$

where C is a constant and x is the distance from the source in meters. If $C = 100$, then find $D(P(10))$ and explain what it means in words.

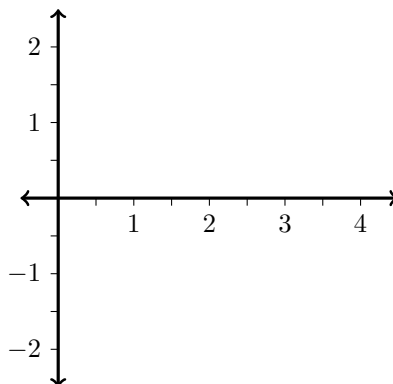
6. Solve the equation $4 = 2^{x/3}$ by taking the base-2 logarithm of both sides.

7. Solve $e^{-4x} = 7$ by taking the natural logarithm of both sides.

8. Graph the function $y = 2^{-x}$ by plotting the y -values when $x = 0, \pm 1,$ and ± 2 .



9. Graph the function $y = \log_2(x)$ by plotting the function at $x = \frac{1}{4}, \frac{1}{2}, 1, 2, 4$ and connecting the dots.



10. Use the properties of logarithms to find $\log_2(4\sqrt{2})$.

11. Solve $\log_2(x^2 - 7x) = 3$. Hint: What power of 2 equals $x^2 - 7x$?

12. Solve $\frac{e^{5x}}{e^{(x^2)}} = e^6$.

13. Solve $\log_3|x - 5| < 1$. Hint: since $\log_3(0)$ is undefined, $x = 5$ is a bad point.

14. Solve $|3^x - 5| > 4$.
