

Sec 5.8 – Exponential & Logarithmic Functions
(Solving Logarithmic Equations)

Name: _____

1. Solve the following **basic** logarithmic equations.

a. $\log_2(3x + 3) = \log_2(5x - 15)$

b. $\log_5(x^2 - 12) = \log_5(4x)$

2. Solve the following **basic** exponential equation by rewriting each as logarithmic equation and approximating the value of x.

a. $\log_2(x) = 7$

b. $\log_3(4x + 1) = 4$

c. $\ln(x - 3) = 5$

3. Solve the following exponential equation by rewriting each as logarithmic equation and approximating the value of x.

a. $\log_2(3x + 2) + 5 = 4$

b. $\log_6(9x) + \log_6(4x) = 6$

c. $3 \cdot \ln(2x + 1) - 2 = 22$

d. $\ln(12x) - 2 \cdot \ln(2) = 8$

4. Solve the following exponential inequalities.

a. $\log_2(3x - 2) > 4$



b. $\log_3(9x + 9) \leq 4$



c. $2 \cdot \ln(x + 2) < 12$

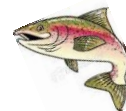


d. $\log_4(4x + 20) \geq 3$



5. Solve the following applications

- a. The population of trout in a lake could be modeled by the equation $P = 250 \cdot \log_2(2t + 2)$ where P is the number of fish and t is the number of years after 2016. If the trend continues, how many years after 2016 will it take for the population to reach 600 trout?



- b. The Richter scale measures the magnitude of an earthquake based on the amount energy determined by the ground motion from a set distance from the epicenter of the quake. The Magnitude is given by $= \frac{2}{3} \log \left(\frac{E}{10^{11.8}} \right)$. If the Magnitude of an earthquake was 7.2, how much energy was released by the earthquake?

