

Solving Logarithmic Equations
Module 2, Unit 4, Lesson 6

Solving Logarithms Equations

1. Express the equation in the form of $\log_b M = c$
 - a. Single logarithm on one side.
 - b. Change to exponential equivalent.
 - c. Solve the exponential equation.

2. Express the equation in the form of $\log_b M = \log_b N$
 - a. Set $M = N$
 - b. Solve.

3. Check for the values for which $M > 0$.

Example 1: Solve.

a. $\log_2(4x+1) = 5$

b. $\ln\sqrt{x+4} - 2 = 3$

c. $\log_4(x+2) - \log_4(x-1) = 1$

d. $\log(5x+1) = \log(2x+3) + \log 2$

e. $\ln(x-5) - \ln(x+4) = \ln 5$

f. $\log_5(x+4) - \log_5(x-1) = \log_5 8$

g. $\log_3(x-5) + \log_3(x+3) = 4 - \log_3 9$

h. $\log_2(x-6) + \log_2(x-4) - \log_2 x = 2$

i. $\ln(x-5) - \ln(x+4) = \ln(x-1) - \ln(x+2)$

j. $2\log x - \log 16 = \log 9$

k. $3 = \ln(x-2) - \ln x$

l. $\log(x^2 + 7x + 12) - \log(x+4) = 0$

Properties of Logarithm Review

Evaluate the following:

1. $\log_4 64$

2. $e^{\ln 40}$

3. $\ln \frac{1}{e^9}$

4. $\log_2 \frac{1}{8}$

5. $\log_7 \frac{1}{\sqrt{7}}$

6. $\log_{125}(\log_2 32)$

7. Condense the logarithm. $\log x + \log(x^2 - 100) - \log 3 - \log(x - 10)$

8. Condense the logarithm. $5\log_3 2 + \frac{1}{5}\log_3(x - 2) - \frac{1}{2}\log_3 x$

9. Expand the logarithm. $\log_3(27xy^4)$

10. Expand the logarithm. $\ln \left[\frac{x^3 \sqrt[5]{x+2}}{(x-1)^2} \right]$