

Students will be able to solve exponential and logarithmic equations by applying properties of logarithms.

Students will identify extraneous solutions when solving logarithmic equations.

Solve for  $x$ . If there is an extraneous solution, identify which one(s).

1.  $3^{1-2x} = 81^x$

2.  $25^x = 5^{x^2+1}$

3.  $6^{3x+5} = 1296^{8x+20}$

4.  $-2\log_7 x = \log_7 36$

5.  $\log_4 x^2 = \log_4 16$

6.  $\ln(x + 7) = \ln(3x - 9)$

7.  $2\log_3(x + 4) - \log_3 9 = 2$

8.  $\log_3(x - 1)^2 = 2$

9.  $\log_4(x^2 - 4) - \log_4(x + 2) = 3$

$$10. 0.3(4^{0.2x}) = 0.2$$

$$11. 3.5(5^{3x}) = 10.3$$

$$12. 43(6^{-3x}) = 20$$

$$13. \log(2x) + \log(x + 1) = \log(12)$$

$$14. \log_5(x + 3) = 1 - \log_5(x - 1)$$

$$15. 4^{5x-3} = 9^x$$

$$16. 3^{4x-6} = 7^x$$

$$17. 8^x = 5^{8x-4}$$