

4.5 WS

Use algebraic procedures to find the solution or solutions of the equations. Round to the nearest hundredth.

1. $2^x = 64$

2. $49^x = \frac{1}{343}$

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

4. $5^x = 70$

5. $3^{x-1} = 251$

6. $2^{x-1} = 3^{x+1}$

7. $2^{2x-3} = 5^{-x-1}$

8. $\log(4x-18) = 1$

9. $\ln(x^2 - 9) = \ln(x+11)$

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

11. $\log(5x-1) = 2 + \log(2x+1)$

12. $\log \sqrt{x^3 - 17} = \frac{1}{2}$

$$13. \ln(2x+5) = \ln(x+3) + \ln(x-1)$$

$$14. \frac{10^x + 10^{-x}}{2} = 20$$

Use the properties of logarithms to expand the following logarithmic expressions. Assume all variable expressions represent positive real numbers. When possible, evaluate logarithmic expressions.

$$15. \log \left[\frac{x^2 y}{1000 \sqrt{z}} \right]$$

$$16. \ln \sqrt[3]{e x y^2 \sqrt{z}}$$

$$17. \log_3 \left[\sqrt{\frac{x+2}{y^{-3} z^5}} \right]$$

Find the domain of each of the following logarithmic functions.

$$18. \log(5-x)$$

$$19. \log_7(x^2 + 10x - 39)$$

$$20. \log_2 \left(\frac{9}{x+12} \right)$$