

## 4.5 WS 2

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

1.  $7^{x+2} = 231$

2.  $9^{5x-3} = 78,462$

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

4.  $3^x = 68$

5.  $4^{x-1} = 600$

6.  $5^{2x+1} = 9^{x+1}$

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

8.  $\log(2x-3) = \log 3$

9.  $\ln(8x-4) = \ln 2 + \ln x$

10.  $\log_9(x+6) + \log_9 x = \log_9 2$

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

12.  $\log(22x+113) = 3$

$$13. \log(x-1) - \log x = \log(x-3)$$

$$14. \frac{10^x + 10^{-x}}{2} = 5$$

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

$$15. \log_4 \left[ \frac{64x^3 \sqrt{y}}{z^2} \right]$$

$$16. \ln \sqrt{xy^5 \sqrt[5]{z}}$$

$$17. \log_3 \left( \frac{x^{-1/3} y}{z^{-2}} \right)^4$$

Find the domain of each of the following logarithmic functions.

$$18. \log(x+13)$$

$$19. \log_{12}(x^2 - 11x + 28)$$

$$20. \log_2 \left( \frac{10}{x+6} \right)$$