

Rewrite the exponential equation in logarithmic form.

1. $5^3 = 125$ _____ $\log_5(125) = 3$

2. $6^{-2} = \frac{1}{36}$ _____ $\log_6\left(\frac{1}{36}\right) = -2$

3. $e^x = 4$ _____ $\ln(4) = x$

Rewrite the logarithmic equation in exponential form.

4. $\log_2 8 = x$ _____ $2^x = 8$

5. $\log_5 625 = 4$ _____ $5^4 = 625$

6. $\ln 18 = x$ _____ $e^x = 18$

Evaluate:

7. $\log_3 9 =$ 2 8. $\log_{0.5} 4 =$ -2

9. $\log_9 9 =$ 1 10. $\log_5 125 =$ 3

11. $\log_7 1/7 =$ -1 12. $\log_4 1/2 =$ -1/2

Expand the expression using the properties of logs.

13. $\log_6(6t)$

$$= \log_6(6) + \log_6(t)$$

$$= \boxed{1 + \log_6(t)}$$

14. $\log(u^4 v^2)$

$$= \log(u^4) + \log(v^2)$$

$$= \boxed{4\log(u) + 2\log(v)}$$

15. $\log_m\left(\frac{ab}{yw}\right)$

$$= \log_m(ab) - \log_m(yw)$$

$$= \boxed{\log_m(a) + \log_m(b) - \log_m(y) - \log_m(w)}$$

Condense the expression using the properties of logs.

16. $2 \log_5 2 + \log_5 6$

$$= \log_5(2^2) + \log_5(6)$$

$$= \log_5(4) + \log_5(6)$$

$$= \boxed{\log_5(24)}$$

17. $\log_4 5 + \log_4 6 - \log_4 10$

$$\log_4(5 \cdot 6) - \log_4(10)$$

$$= \log_4(30) - \log_4(10)$$

$$= \log_4\left(\frac{30}{10}\right)$$

$$= \boxed{\log_4(3)}$$