

DIRECTIONS: Simplify each logarithm.

1. $\log_5 125$
3

2. $\log_4 16$
2

3. $\log_3 81$
4

4. $\log_6 6$
1

5. $\log_3 1$
0

6. $\log_8 4$
 $\frac{2}{3}$

7. $\log_5 \frac{1}{25}$
-2

8. $\log_2 \frac{1}{8}$
-3

9. $\log_6 6\sqrt{6}$
 $\frac{3}{2}$

10. $\log_5 25\sqrt{5}$
 $\frac{5}{2}$

11. $\log_4 \sqrt{2}$
 $\frac{1}{4}$

12. $\log_{27} \sqrt{3}$
 $\frac{1}{6}$

13. $\log_7 \sqrt[3]{49}$
 $\frac{2}{3}$

14. $\log_3 \sqrt[5]{9}$
 $\frac{2}{5}$

15. $\log_{1/2} 8$
-3

16. $\log_{1/3} 27$
-3

17. $\log_2 \sqrt[3]{\frac{1}{4}}$
 $-\frac{2}{3}$

18. $\log_{10} \frac{1}{\sqrt{1000}}$
 $-\frac{3}{2}$

DIRECTIONS: Solve for x .

$$\begin{aligned} 19. \log_7 x &= 2 \\ x &= 49 \end{aligned}$$

$$\begin{aligned} 20. \log_6 x &= 3 \\ x &= 216 \end{aligned}$$

$$\begin{aligned} 21. \log_9 x &= -\frac{1}{2} \\ x &= \frac{1}{3} \end{aligned}$$

$$\begin{aligned} 22. \log_6 x &= 2.5 \\ x &= 36\sqrt{6} \end{aligned}$$

$$\begin{aligned} 23. \log_4 x &= -\frac{3}{2} \\ x &= \frac{1}{8} \end{aligned}$$

$$\begin{aligned} 24. \log_{1/9} x &= -\frac{1}{2} \\ x &= 3 \end{aligned}$$

$$\begin{aligned} 25. \log_x 27 &= \frac{3}{2} \\ x &= 9 \end{aligned}$$

$$\begin{aligned} 26. \log_x 64 &= 6 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} 27. \log_x 7 &= -\frac{1}{2} \\ x &= \frac{1}{49} \end{aligned}$$

$$\begin{aligned} 28. \log_x 7 &= 1 \\ x &= 7 \end{aligned}$$

$$\begin{aligned} 29. \log_x 1 &= 0 \\ x &> 0 \\ &\text{(but not } x = 1) \end{aligned}$$

$$\begin{aligned} 30. \log_x 2 &= 0 \\ &\text{No solution} \end{aligned}$$