

SIMPLIFY LOG FUNCTIONS

Express in exponential form.

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|--|--|----------------------------------|------------------------------------|
| 1. $\log_3 27 = 3$
$3^3 = 27$ | 2. $\log_6 36 = 2$
$6^2 = 36$ | 3. $\log_3 81 = 4$
$3^4 = 81$ | 4. $\log_5 125 = 3$
$5^3 = 125$ |
| 5. $\log_3 \frac{1}{9} = -2$
$3^{-2} = \frac{1}{9}$ | 6. $\log_2 \frac{1}{8} = -3$
$2^{-3} = \frac{1}{8}$ | 7. $\log_b m = n$
$b^n = m$ | 8. $\log_a k = 1$
$a^1 = k$ |

Express in logarithmic form.

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|---|---|---|---|
| 9. $3^4 = 81$
$\log_3 81 = 4$ | 10. $2^7 = 128$
$\log_2 128 = 7$ | 11. $8^{-2/3} = \frac{1}{4}$
$\log_8 \frac{1}{4} = \frac{-2}{3}$ | 12. $16^{-3/4} = \frac{1}{8}$
$\log_{16} \frac{1}{8} = \frac{-3}{4}$ |
| 13. $10^{-1} = 0.1$
$\log_{10} 0.1 = -1$ | 14. $10^{-2} = 0.01$
$\log_{10} 0.01 = -2$ | 15. $6^{3/2} = 6\sqrt{6}$
$\log_6 6\sqrt{6} = \frac{3}{2}$ | 16. $15^{3/2} = 15\sqrt{15}$
$\log_{15} 15\sqrt{15} = \frac{3}{2}$ |

Evaluate.

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|---------------------------------|-------------------------------------|--------------------------------|------------------------------------|
| 17. $\log_4 64$
3 | 18. $\log_3 81$
4 | 19. $\log_5 125$
3 | 20. $\log_3 \frac{1}{27}$
-3 |
| 21. $\log_2 \frac{1}{32}$
-5 | 22. $\log_{10} \frac{1}{100}$
-2 | 23. $\log_5 5\sqrt{5}$
3/2 | 24. $\log_{15} 15\sqrt{15}$
3/2 |
| 25. $\log_5 125 = x + 4$
-1 | 26. $\log_6 36 = 4x - 2$
1 | 27. $\log_3 27 = 3x + 6$
-1 | |

Solve for x.

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|--|--|---|
| 28. $\log_{10} 0.001 = x$
-3 | 29. $\log_{10} 0.1 = x$
-1 | 30. $\log_5 125 = x + 4$
-1 |
| 31. $\log_3 27 = 3x + 6$
-1 | 32. $\log_4 16 = 2x - 2$
2 | 33. $\log_6 36 = 4x - 2$
1 |
| 34. $\log_3 \frac{1}{9} = \frac{x}{3}$
-6 | 35. $\log_4 \frac{1}{4} = \frac{x}{8}$
-8 | 36. $\log_7 \frac{1}{49} = -x - 2$
0 |
| 37. $\log_{11} \frac{1}{121} = -x - 4$
-2 | 38. $\log_{0.1} x = 3$
0.001 | 39. $\log_{0.1} x = -2$
100 |