

Practice

Common Logarithms

Given that $\log 3 = 0.4771$, $\log 5 = 0.6990$, and $\log 9 = 0.9542$, evaluate each logarithm.

1. $\log 300,000$
2. $\log 0.0005$
3. $\log 9000$
4. $\log 27$
5. $\log 75$
6. $\log 81$

Evaluate each expression.

7. $\log 66.3$
8. $\log \frac{17^4}{5}$
9. $\log 7(4^3)$

Find the value of each logarithm using the change of base formula.

10. $\log_6 832$
11. $\log_{11} 47$
12. $\log_3 9$

Solve each equation or inequality.

13. $8^x = 10$
14. $2.4^x \leq 20$
15. $1.8^{x-5} = 19.8$
16. $3^{5x} = 85$
17. $4^{2x} > 25$
18. $3^{2x-2} = 2^x$

19. Seismology The intensity of a shock wave from an earthquake is given by the formula $R = \log_{10} \frac{I}{I_0}$, where R is the magnitude, I is a measure of wave energy, and $I_0 = 1$. Find the intensity per unit of area for the following earthquakes.

- a. Northridge, California, in 1994, $R = 6.7$
- b. Hector Mine, California, in 1999, $R = 7.1$