

Remember: In general, $b^y = x$ means that $\log_b x = y$

$$\log_b x = y \longrightarrow b^y = x$$

Write each equation in logarithmic form:

1. $4^3 = 64$

2. $4^{-3} = \frac{1}{64}$

3. $2^7 = 128$

4. $3^4 = 81$

5. $10^6 = 1,000,000$

6. $6^1 = 6$

7. $8^{-2} = \frac{1}{64}$

Write each equation in exponential form:

8. $\log_{15} 225 = 2$

9. $\log_3 243 = 5$

10. $\log_5 \frac{1}{25} = -2$

11. $\log_6 216 = 3$

12. $\log_{27} 3 = \frac{1}{3}$

13. $\log_4 1 = 0$

Evaluate these logarithmic expressions:

14. $\log_2 16$

15. $\log_8 1$

16. $\log_5 25$

17. $\log_2 32$

18. $\log_5 \frac{1}{125}$

19. $\log_2 \frac{1}{4}$

Evaluate these logarithmic expressions:

20. $\log_2 64$

21. $\log_{10} 10000$

22. $\log_8 8$

23. $\log_3 81$

24. $\log_3 \frac{1}{81}$

25. $\log_9 3$

Find the inverse of the following functions:

26. $y = \log_{1/2}(x)$

27. $y = 3^{x-2}$

28. $y = \log(x + 4)$

27. $y = \log_4(3x)$

28. $y = e^x + 2$

29. $y = 3^{x-6} + 1$

30. The wind speed s (in miles per hour) near the center of a tornado can be modeled by $s = 93 \log d + 65$ where d is the distance (in miles) that the tornado travels.

a) In 1925, a tornado traveled 220 miles through three states. Find the wind speed near the tornado's center.

b) If the tornado's wind speed near the center is 60 miles per hour, how far did the tornado travel?