

**Algebra II - Worksheet 7.4 A**  
**Properties of Logs**

(09 br)

Write each equation in **exponential** form.

1.  $\log_2 64 = 6$

2.  $\log_4 \frac{1}{64} = -3$

3.  $\log_{10} (0.01) = -2$

Write each equation in **logarithmic** form.

4.  $2^5 = 32$

5.  $5^{-1/2} = \frac{\sqrt{5}}{5}$

6.  $10^{-1} = 0.1$

**Evaluate** the expression. Hint—set = x and solve for x.

7.  $\log_2 8$

8.  $\log_8 64$

9.  $\log_6 216$

10.  $\log_7 7$

11.  $\log_6 1$

12.  $\log_8 \frac{1}{8}$

13.  $\log_7 \frac{1}{49}$

14.  $\log_9 \frac{1}{27}$

15.  $\log_5 \sqrt{5}$

16.  $\log_9 3$

17.  $\log_2 16$

18.  $\log_{1/2} 16$

Solve for x.

19.  $\log_6 x = 2$

20.  $\log_5 x = 3$

21.  $\log_{16} x = -1$

22.  $\log_9 x = 2$

23.  $\log_{1/4} x = -2$

24.  $\log_x 64 = 3$

25.  $\log_x 8 = -1$

**Expand** the expression using the properties of logs. The word log will be used **repeatedly** in each problem.

26.  $\log_6 3x$

27.  $\log_2 \frac{x}{5}$

28.  $\log_{10} xy^2$

29.  $\log_4 \frac{xy}{3}$

30.  $\log_3 x^2yz$

31.  $\log_5 2x$

**Condense** the expression using the properties of logs. The word log will be used **once** in each problem.

32.  $\log_3 7 - \log_3 x$

33.  $2 \log_5 x + \log_5 3$

34.  $\log_4 5 + \log_4 x + \log_4 y$

35.  $3 \log_{10} x - \log_{10} 4$

36.  $2 \log_2 x - 3 \log_2 y$

37.  $\log_3 4 + 2 \log_3 x - \log_3 5$

38.  $\log_2 x - 2 \log_5 y$

39.  $3 \log_a 2 + \log_a 6 - 2 \log_a 4$

Condense the left side of the equation, **then** solve for x.

40.  $2 \log_4 3 = \log_4 x$

41.  $\log_{10} x + \log_{10} 3 = \log_{10} 12$

42.  $\log_3 5 - \log_3 x = \log_3 2$

43.  $2 \log_3 2 = \log_3 x$

44.  $3 \log_{10} x = \log_{10} 27$

45.  $3 \log_5 2 + \log_5 x = \log_5 24$