

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Properties of Logarithms

Write each expression as a single logarithm.

1.  $\log_5 4 + \log_5 3$

2.  $\log_6 25 - \log_6 5$

3.  $\log_2 4 + \log_2 2 - \log_2 8$

4.  $\log_4 60 - \log_4 4 + \log_4 x$

5.  $\log 7 - \log 3 + \log 6$

6.  $2 \log x - 3 \log y$

7.  $\log_3 4x + 2 \log_3 5y$

8.  $5 \log 2 - 2 \log 2$

9.  $2 \log 4 + \log 2 + \log 2$

10.  $(\log 3 - \log 4) - \log 2$

11.  $5 \log x + 3 \log x^2$

12.  $\log_6 3 - \log_6 6$

13.  $\log 2 + \log 4 - \log 7$

14.  $\log_3 2x - 5 \log_3 y$

15.  $3(4 \log t^2)$

Expand each logarithm. Simplify if possible.

16.  $\log xyz$

17.  $\log_2 \frac{x}{yz}$

18.  $\log 7(3x - 2)^2$

19.  $\log \sqrt{\frac{2rst}{5w}}$

20.  $\log \frac{5x}{4y}$

21.  $\log_5 5x^{-5}$

22.  $\log \frac{2x^2 y}{3k^3}$

23.  $\log_4 (3xyz)^2$

Use the Change of Base Formula to evaluate each expression. Round your answer to the nearest thousandth.

24.  $\log_4 32$

25.  $\log_3 5$

26.  $\log_2 15$

27.  $\log_6 17$

Use the properties of logarithms to evaluate each expression.

28.  $\log_2 8 + \log_2 4$

29.  $\log_2 160 - \log_2 5$

30.  $\log_6 27 + \log_6 8$

31.  $\log_7 14 - \log_7 2$

32.  $\log_4 64 + 2 \log_4 2$

33.  $\frac{1}{4} \log_3 162 - \log_3 \sqrt[4]{2}$