

## Properties of Logarithms HW

Given  $\log_3 7 \approx 1.7712$ , approximate the value for each logarithm by using the Product and Quotient Properties of Logarithms.

1.  $\log_3 49$

2.  $\log_3 \frac{3}{7}$

Write each expression as a single logarithm. Then simplify, if possible.

3.  $\log_3 x - \log_3 y + \log_3 z$

4.  $\log_2 3 + \log_2 6 - \log_2 10$

5.  $\log_2 5 + \log_2 7$

6.  $\log_3 45 - \log_3 9$

7.  $\log_2 5 + \log_2 x - \log_2 10$

8.  $\log_7 3x - \log_7 9x + \log_7 6y$

9.  $5 \log_2 m - 2 \log_2 n$

10.  $4 \log_b m + \frac{1}{2} \log_b n - 3 \log_b 2p$

11.  $1 - 2 \log_7 x$

Evaluate each expression.

12.  $\log_4 16^8$

13.  $3^{\log_3 12}$

14.  $\log_7 7^3$

15.  $3^{\log_3 8}$

16.  $\log_4 4^5$

17.  $7^{\log_7 9} + \log_2 8$

18.  $\log_9 9^{11} - \log_4 64$

19.  $6^{\log_6 3} - \log_5 \frac{1}{25}$

20.  $\log_3 \frac{1}{9} - 2^{\log_2 3}$

Use the values given below to approximate the value of each logarithmic expression in Exercise 22-27.

$\log_2 7 \approx 2.8074$	$\log_2 5 \approx 2.3219$	$\log_4 5 \approx 1.1610$
$\log_4 3 \approx 0.7925$	$\log_2 3 \approx 1.5850$	$\log_{10} 8.3 \approx 0.9191$

21.  $\log_4 15$

22.  $\log_2 28$

23.  $\log_4 60$

24.  $\log_{10} 830$

25.  $\log_4 \frac{3}{5}$

26.  $\log_4 \frac{5}{4}$