

**6.4 Introduction to  
Logarithms**

Name \_\_\_\_\_

Write the following exponential equations in logarithmic form.

1.  $5^3 = 125$

2.  $10^3 = 1000$

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

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

5.  $2^x = 16$

6.  $3^x = 9$

7.  $a^0 = 1$

8.  $e^1 = e$

Answers: 1.  $\log_5 125 = 3$ ; 3.  $\log_4 2 = \frac{1}{2}$ ; 5.  $\log_2 16 = x$ ; 7.  $\log_a 1 = 0$ ;

Evaluate.	
<b>9.</b> $\log_6 36$	<b>10.</b> $\log_4 64$
<b>11.</b> $\log_3 81$	<b>12.</b> $\log_5 125$
<b>13.</b> $\log_7 \sqrt{7}$	<b>14.</b> $\log_2 \sqrt[3]{2}$
<b>15.</b> $\log 1,000$	<b>16.</b> $\log 0.001$
Answers: <b>9.</b> 2; <b>11.</b> 4; <b>13.</b> $\frac{1}{2}$ ; <b>15.</b> 3	

Use a calculator to evaluate to two decimal places (x.xx). Some problems will require the change of base formula.

17.  $\log 20$

18.  $\log 0.06$

19.  $\ln 2$

20.  $\ln 10$

21.  $\log 0.01$

22.  $\log 100,000$

23.  $\ln e^2$

24.  $\ln \frac{1}{e}$

25.  $\log_2 100$

26.  $\log_3 79$

27.  $\log_\pi 0.0001$

28.  $\log_{100} e$

Answers: 17. 1.30; 19. 0.69; 21. -2; 23. 2; 25. 6.64; 27. -8.05