

Write each equation in exponential form.

1.  $\log_8 512 = 3$

2.  $\log_5 625 = 4$

Write each equation in logarithmic form.

3.  $11^3 = 1331$

4.  $16^{\frac{3}{4}} = 8$

Evaluate each expression.

5.  $\log_{13} 169$

6.  $\log_2 \frac{1}{128}$

7.  $\log_6 1$

Write each equation in exponential form.

13.  $\log_2 16 = 4$

14.  $\log_7 343 = 3$

15.  $\log_9 \frac{1}{81} = -2$

16.  $\log_3 \frac{1}{27} = -3$

17.  $\log_{12} 144 = 2$

18.  $\log_9 1 = 0$

Write each equation in logarithmic form.

19.  $9^{-1} = \frac{1}{9}$

20.  $6^{-3} = \frac{1}{216}$

21.  $2^8 = 256$

22.  $4^6 = 4096$

23.  $27^{\frac{2}{3}} = 9$

24.  $25^{\frac{3}{2}} = 125$

Evaluate each expression.

25.  $\log_3 \frac{1}{9}$

26.  $\log_4 \frac{1}{64}$

27.  $\log_8 512$

28.  $\log_6 216$

29.  $\log_{27} 3$

30.  $\log_{32} 2$

31.  $\log_9 3$

32.  $\log_{121} 11$

33.  $\log_{\frac{1}{5}} 3125$

34.  $\log_{\frac{1}{8}} 512$

35.  $\log_{\frac{1}{3}} \frac{1}{81}$

36.  $\log_{\frac{1}{6}} \frac{1}{216}$

65. **ERROR ANALYSIS** Elisa and Matthew are evaluating  $\log_{\frac{1}{7}} 49$ . Is either of them correct? Explain your reasoning.

*Elisa*

$$\log_{\frac{1}{7}} 49 = y$$
$$\frac{1^y}{7} = 49$$
$$(7^{-1})^y = 7^2$$
$$(7)^{-y} = 7^2$$
$$y = 2$$

*Matthew*

$$\log_{\frac{1}{7}} 49 = y$$
$$49^y = \frac{1}{7}$$
$$(7^2)^y = (7)^{-1}$$
$$7^{2y} = (7)^{-1}$$
$$2y = -1$$
$$y = -\frac{1}{2}$$

66. **WRITING IN MATH** A transformation of  $\log_{10} x$  is  $g(x) = a \log_{10}(x - h) + k$ . Explain the process of graphing this transformation.

### Standardized Test Practice

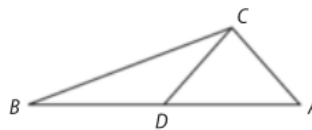
67. A rectangle is twice as long as it is wide. If the width of the rectangle is 3 inches, what is the area of the rectangle in square inches?

A 9  
B 12  
C 15  
D 18

68. **SAT/ACT** Ichiro has some pizza. He sold 40% more slices than he ate. If he sold 70 slices of pizza, how many did he eat?

F 25  
G 50  
H 75  
J 98  
K 100

69. **SHORT RESPONSE** In the figure  $AB = BC$ ,  $CD = BD$ , and  $m\angle CAD = 70^\circ$ . What is the measure of angle  $ADC$ ?



70. If  $6x - 3y = 30$  and  $4x = 2 - y$  then find  $x + y$ .

A -4  
B -2  
C 2  
D 4