

The Meaning Of Logarithms

Rewrite each equation in exponential form.

1) $\log_6 36 = 2$

$$6^2 = 36$$

2) $\log_{289} 17 = \frac{1}{2}$

$$289^{\frac{1}{2}} = 17$$

3) $\log_{14} \frac{1}{196} = -2$

$$14^{-2} = \frac{1}{196}$$

4) $\log_3 81 = 4$

$$3^4 = 81$$

Rewrite each equation in logarithmic form.

5) $64^{\frac{1}{2}} = 8$

$$\log_{64} 8 = \frac{1}{2}$$

6) $12^2 = 144$

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

7) $9^{-2} = \frac{1}{81}$

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

8) $\left(\frac{1}{12}\right)^2 = \frac{1}{144}$

$$\log_{\frac{1}{12}} \frac{1}{144} = 2$$

Rewrite each equation in exponential form.

9) $\log_u \frac{15}{16} = v$

$$u^v = \frac{15}{16}$$

10) $\log_v u = 4$

$$v^4 = u$$

11) $\log_{\frac{7}{4}} x = y$

$$\left(\frac{7}{4}\right)^y = x$$

12) $\log_2 v = u$

$$2^u = v$$

13) $\log_u v = -16$

$$u^{-16} = v$$

14) $\log_y x = -8$

$$y^{-8} = x$$

Rewrite each equation in logarithmic form.

15) $u^{-14} = v$

$$\log_u v = -14$$

16) $8^b = a$

$$\log_8 a = b$$

17) $\left(\frac{1}{5}\right)^x = y$

$$\log_{\frac{1}{5}} y = x$$

18) $6^y = x$

$$\log_6 x = y$$

19) $9^y = x$

$$\log_9 x = y$$

20) $b^a = 123$

$$\log_b 123 = a$$

Evaluate each expression.

21) $\log_4 64$

3

22) $\log_6 216$

3

23) $\log_4 16$

2

24) $\log_3 \frac{1}{243}$

-5

25) $\log_5 125$

3

26) $\log_2 4$

2

27) $\log_{343} 7$

 $\frac{1}{3}$

28) $\log_2 16$

4

29) $\log_{64} 4$

 $\frac{1}{3}$

30) $\log_6 \frac{1}{216}$

-3

Simplify each expression.

31) $12^{\log_{12} 144}$

144

32) $5^{\log_5 17}$

17

33) $x^{\log_x 72}$

72

34) $9^{\log_9 20}$

20