

## The Meaning Of Logarithms

**Rewrite each equation in exponential form.**

1)  $\log_6 36 = 2$

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

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

4)  $\log_3 81 = 4$

**Rewrite each equation in logarithmic form.**

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

6)  $12^2 = 144$

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

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

**Rewrite each equation in exponential form.**

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

10)  $\log_v u = 4$

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

12)  $\log_2 v = u$

13)  $\log_u v = -16$

14)  $\log_y x = -8$

**Rewrite each equation in logarithmic form.**

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

16)  $8^b = a$

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

18)  $6^y = x$

19)  $9^y = x$

20)  $b^a = 123$

**Evaluate each expression.**

21)  $\log_4 64$

22)  $\log_6 216$

23)  $\log_4 16$

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

25)  $\log_5 125$

26)  $\log_2 4$

27)  $\log_{343} 7$

28)  $\log_2 16$

29)  $\log_3 27$

30)  $\log_5 25$

31)  $\log_{64} 4$

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

**Simplify each expression.**

33)  $12^{\log_{12} 144}$

34)  $5^{\log_5 17}$

35)  $x^{\log_x 72}$

36)  $9^{\log_3 20}$

## 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.**

$$21) \log_4 64$$
$$3$$

$$22) \log_6 216$$
$$3$$

$$23) \log_4 16$$
$$2$$

$$24) \log_3 \frac{1}{243}$$
$$-5$$

$$25) \log_5 125$$
$$3$$

$$26) \log_2 4$$
$$2$$

$$27) \log_{343} 7$$
$$\frac{1}{3}$$

$$28) \log_2 16$$
$$4$$

$$29) \log_3 27$$
$$3$$

$$30) \log_5 25$$
$$2$$

$$31) \log_{64} 4$$
$$\frac{1}{3}$$

$$32) \log_6 \frac{1}{216}$$
$$-3$$

**Simplify each expression.**

$$33) 12^{\log_{12} 144}$$
$$144$$

$$34) 5^{\log_5 17}$$
$$17$$

$$35) x^{\log_x 72}$$
$$72$$

$$36) 9^{\log_3 20}$$
$$400$$