

**Logarithm - Solve**

L2MS4

Solve for x.

Example 1:

$$\begin{aligned}\log_5 \left(\frac{1}{5}\right) &= x-7 \\ (5)^{x-7} &= \left(\frac{1}{5}\right) \\ (5)^{x-7} &= 5^{-1} \\ x &= \mathbf{6}\end{aligned}$$

Example 2:

$$\begin{aligned}\log_{4x} 8^{-2} &= -6 \\ 4x^{-6} &= 8^{-2} \\ 4x^{-6} &= (2^3)^{-2} \\ x &= \mathbf{\frac{1}{2}}\end{aligned}$$

Solve for x.

1)  $\log_{x-8} (6) = \frac{1}{3}$

x = 

2)  $\log_{125} 25 = x+6$

3)  $5 \log_8 (x-5) = 10$

x = 

5)  $\log_2 (x+9)^{\frac{1}{6}} = 1$

x = 

7)  $\log_{x+9} (32) = 5$

x = 

9)  $\log_{\frac{1}{3}} \left(\frac{1}{27}\right) = 6x$

x = 

10)  $\log_2 \left(\frac{1}{64}\right) = \frac{x}{6}$

x = 

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Example 1:

$$\begin{aligned}\log_5 \left(\frac{1}{5}\right) &= x-7 \\ (5)^{x-7} &= \left(\frac{1}{5}\right) \\ (5)^{x-7} &= 5^{-1} \\ x &= \mathbf{6}\end{aligned}$$

Example 2:

$$\begin{aligned}\log_{4x} 8^{-2} &= -6 \\ 4x^{-6} &= 8^{-2} \\ 4x^{-6} &= (2^3)^{-2} \\ x &= \mathbf{\frac{1}{2}}\end{aligned}$$

Solve for x.

1)  $\log_{x-8} (6) = \frac{1}{3}$

x = **224**

2)  $\log_{125} 25 = x+6$

3)  $5 \log_8 (x-5) = 10$

x = **69**

5)  $\log_2 (x+9)^{\frac{1}{6}} = 1$

x = **55**

7)  $\log_{x+9} (32) = 5$

x = **-7**

x =  **$\frac{8}{3}$**

9)  $\log_{\frac{1}{3}} \left(\frac{1}{27}\right) = 6x$

x =  **$\frac{1}{2}$**

10)  $\log_2 \left(\frac{1}{64}\right) = \frac{x}{6}$

x = **-36**

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