

Evaluating Expressions

Example :

Evaluate the expression : $\log_{16} 4^4 + \log_{\frac{1}{27}} 3^{-1}$

$$\begin{aligned} \log_{16} 4^4 + \log_{\frac{1}{27}} 3^{-1} &= \log_{16} 16^2 + \frac{1}{3} \log_{\frac{1}{27}} \left(\frac{1}{27}\right) \\ &= 2(1) + \frac{1}{3}(1) \\ &= \frac{7}{3} \end{aligned}$$

$$\log_a b^c = c \log_a b$$

$$\log_a a = 1$$

Evaluate each expression.

1) $\left(\frac{1}{2}\right) \log_{\frac{1}{32}} 4 - \log_{25} 5^{-2}$

Answer

2) $\log_{\frac{1}{64}} \left(\frac{1}{4}\right) \cdot \log_{81} 9$

2

3) $\frac{5 \log_{27} 3}{\log_{\frac{1}{25}} 5}$

Answer

5) $\log_{\frac{1}{2}} 64 + 7 \log_{12}$

Answer

7) $3 \log_{\frac{1}{4}} 16 \cdot \log_{36}$

Answer

9) $\log_{81} 3^6 + 2 \log_{\frac{1}{12}} 144$

Answer

10) $\log_{128} 2 - \log_{\frac{1}{49}} 7^3$

Answer

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Example :

Evaluate the expression : $\log_{16} 4^4 + \log_{\frac{1}{27}} 3^{-1}$

$$\begin{aligned}\log_{16} 4^4 + \log_{\frac{1}{27}} 3^{-1} &= \log_{16} 16^2 + \frac{1}{3} \log_{\frac{1}{27}} \left(\frac{1}{27}\right) \\ &= 2(1) + \frac{1}{3}(1) \\ &= \frac{7}{3}\end{aligned}$$

$\log_a b^c = c \log_a b$

$\log_a a = 1$

Evaluate each expression.

1) $\left(\frac{1}{2}\right) \log_{\frac{1}{32}} 4 - \log_{25} 5^{-2}$

Answer

$\frac{1}{6}$

2) $\log_{\frac{1}{64}} \left(\frac{1}{4}\right) \cdot \log_{81} 9$

2

3) $\frac{5 \log_{27} 3}{\log_{\frac{1}{25}} 5}$

Answer

$\frac{5}{2}$

5) $\log_{\frac{1}{2}} 64 + 7 \log_{12}$

Answer

$-\frac{5}{2}$

7) $3 \log_{\frac{1}{4}} 16 \cdot \log_{36}$

Answer

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Answer

$-\frac{1}{5}$

9) $\log_{81} 3^6 + 2 \log_{\frac{1}{12}}$

Answer

$-\frac{5}{2}$

10) $\log_{128} 2 - \log_{\frac{1}{49}} 7^3$

Answer

$\frac{23}{14}$