

$$\log_{\star} 1 = 0$$

$$\log_7 1 = 0$$

$$\log_{10} 1 = 0$$

$$\log_{2.5} 1 = 0$$

$$\log_{\frac{3}{4}} 1 = 0$$

$$\log_{\star} \star = 1$$

$$\log_5 5 = 1$$

$$\log_4 4 = 1$$

$$\log_{3.6} 3.6 = 1$$

$$\log_{\frac{1}{3}} \frac{1}{3} = 1$$

$$\log_{\star} \star^{\circ} = \circ$$

$$\log_3 3^5 = 5$$

$$\log_{11} 11^2 = 2$$

$$\log_7 7^{-3} = -3$$

$$\log_{\frac{3}{4}} \left(\frac{3}{4}\right)^6 = 6$$

$$\log_{\star} \bigcirc + \log_{\star} \triangle = \log_{\star} (\bigcirc \times \triangle)$$

$$\log_5 3 + \log_5 6$$

$$\log_{\star} \bigcirc + \log_{\star} \triangle = \log_{\star} (\bigcirc \times \triangle)$$

$$\log_5 3 + \log_5 6 = \log_5 (3 \times 6)$$

$$\log_{\star} \bigcirc + \log_{\star} \triangle = \log_{\star} (\bigcirc \times \triangle)$$

$$\begin{aligned} \log_5 3 + \log_5 6 &= \log_5 (3 \times 6) \\ &= \log_5 18 \end{aligned}$$

$$\log_{\star} \bigcirc + \log_{\star} \triangle = \log_{\star} (\bigcirc \times \triangle)$$

$$\begin{aligned} \log_5 3 + \log_5 6 &= \log_5 (3 \times 6) \\ &= \log_5 18 \end{aligned}$$

たし算はかけ算へ！

$$\log_{\star} \bigcirc + \log_{\star} \triangle = \log_{\star} (\bigcirc \times \triangle)$$

$$\log_2 7 + \log_2 4$$

$$\log_{\star} \bigcirc + \log_{\star} \triangle = \log_{\star} (\bigcirc \times \triangle)$$

$$\log_2 7 + \log_2 4 = \log_2 (7 \times 4)$$

$$\log_{\star} \bigcirc + \log_{\star} \triangle = \log_{\star} (\bigcirc \times \triangle)$$

$$\begin{aligned} \log_2 7 + \log_2 4 &= \log_2 (7 \times 4) \\ &= \log_2 28 \end{aligned}$$

$$\log_{\star} \bigcirc + \log_{\star} \triangle = \log_{\star} (\bigcirc \times \triangle)$$

$\log_3 8 + \log_7 5$ は計算できません。

$$\log_{\star} \bigcirc - \log_{\star} \triangle = \log_{\star} \frac{\bigcirc}{\triangle}$$

$$\log_7 12 - \log_7 4$$

$$\log_{\star} \bigcirc - \log_{\star} \triangle = \log_{\star} \frac{\bigcirc}{\triangle}$$

$$\log_7 12 - \log_7 4 = \log_7 \frac{12}{4}$$

$$\log_{\star} \bigcirc - \log_{\star} \triangle = \log_{\star} \frac{\bigcirc}{\triangle}$$

$$\begin{aligned} \log_7 12 - \log_7 4 &= \log_7 \frac{12}{4} \\ &= \log_7 3 \end{aligned}$$

$$\log_{\star} \bigcirc - \log_{\star} \triangle = \log_{\star} \frac{\bigcirc}{\triangle}$$

$$\begin{aligned} \log_7 12 - \log_7 4 &= \log_7 \frac{12}{4} \\ &= \log_7 3 \end{aligned}$$

ひき算はわり算へ！

$$\log_{\star} \bigcirc - \log_{\star} \triangle = \log_{\star} \frac{\bigcirc}{\triangle}$$

$$\log_3 48 - \log_3 8$$

$$\log_{\star} \bigcirc - \log_{\star} \triangle = \log_{\star} \frac{\bigcirc}{\triangle}$$

$$\log_3 48 - \log_3 8 = \log_3 \frac{48}{8}$$

$$\log_{\star} \bigcirc - \log_{\star} \triangle = \log_{\star} \frac{\bigcirc}{\triangle}$$

$$\begin{aligned} \log_3 48 - \log_3 8 &= \log_3 \frac{48}{8} \\ &= \log_3 6 \end{aligned}$$

$$\log_{\star} \bigcirc - \log_{\star} \triangle = \log_{\star} \frac{\bigcirc}{\triangle}$$

$\log_7 18 - \log_2 9$ は計算できません。

対数の計算 (応用編)

$$\log_7 6 + \log_7 8 - \log_7 3$$

対数の計算 (応用編)

$$\begin{aligned} & \log_7 6 + \log_7 8 - \log_7 3 \\ = & \log_7(6 \times 8) - \log_7 3 \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & \log_7 6 + \log_7 8 - \log_7 3 \\ = & \log_7(6 \times 8) - \log_7 3 \\ = & \log_7 \frac{6 \times 8}{3} \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & \log_7 6 + \log_7 8 - \log_7 3 \\ = & \log_7(6 \times 8) - \log_7 3 \\ = & \log_7 \frac{6 \times 8}{3} \\ = & \log_7 \frac{\overset{2}{\cancel{6}} \times 8}{\cancel{3} \underset{1}{}} \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & \log_7 6 + \log_7 8 - \log_7 3 \\ &= \log_7(6 \times 8) - \log_7 3 \\ &= \log_7 \frac{6 \times 8}{3} \\ &= \log_7 \frac{\overset{2}{\cancel{6}} \times 8}{\cancel{3} \underset{1}{}} = \log_7 16 \end{aligned}$$

$$\log_{\star} \triangle^{\circ} = \circ \log_{\star} \triangle$$

$$\log_5 8$$

$$\log_{\star} \triangle^{\circ} = \circ \log_{\star} \triangle$$

$$\log_5 8 = \log_5 2^3$$

$$\log_{\star} \triangle^{\circ} = \circ \log_{\star} \triangle$$

$$\begin{aligned} \log_5 8 &= \log_5 2^3 \\ &= 3 \log_5 2 \end{aligned}$$

$$\log_{\star} \triangle^{\circ} = \circ \log_{\star} \triangle$$

$$\begin{aligned} \log_5 8 &= \log_5 2^3 \\ &= 3 \log_5 2 \\ & \text{(} = 3 \times \log_5 2 \text{ のことです)} \end{aligned}$$

$$\log_{\star} \triangle^{\circ} = \circ \log_{\star} \triangle$$

$$\log_7 81$$

$$\log_{\star} \triangle^{\circ} = \circ \log_{\star} \triangle$$

$$\log_7 81 = \log_7 3^4$$

$$\log_{\star} \triangle^{\circ} = \circ \log_{\star} \triangle$$

$$\begin{aligned} \log_7 81 &= \log_7 3^4 \\ &= 4 \log_7 3 \end{aligned}$$

$$\log_{\star} \triangle^{\odot} = \odot \log_{\star} \triangle$$

$$\begin{aligned} \log_7 81 &= \log_7 3^4 \\ &= 4 \log_7 3 \\ & \text{(} = 4 \times \log_7 3 \text{ のことです)} \end{aligned}$$

対数の計算 (応用編)

$$\log_3 12 + \log_3 6 - 3 \log_3 2$$

対数の計算 (応用編)

$$\begin{aligned} & \log_3 12 + \log_3 6 - 3 \log_3 2 \\ = & \log_3 12 + \log_3 6 - \log_3 2^3 \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & \log_3 12 + \log_3 6 - 3 \log_3 2 \\ = & \log_3 12 + \log_3 6 - \log_3 2^3 \\ = & \log_3 \frac{12 \times 6}{2^3} \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & \log_3 12 + \log_3 6 - 3 \log_3 2 \\ = & \log_3 12 + \log_3 6 - \log_3 2^3 \\ = & \log_3 \frac{12 \times 6}{2^3} \\ = & \log_3 9 \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & \log_3 12 + \log_3 6 - 3 \log_3 2 \\ = & \log_3 12 + \log_3 6 - \log_3 2^3 \\ = & \log_3 \frac{12 \times 6}{2^3} \\ = & \log_3 9 = \log_3 3^2 \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & \log_3 12 + \log_3 6 - 3 \log_3 2 \\ = & \log_3 12 + \log_3 6 - \log_3 2^3 \\ = & \log_3 \frac{12 \times 6}{2^3} \\ = & \log_3 9 = \log_3 3^2 = 2 \end{aligned}$$

対数の計算 (応用編)

$$2 \log_6 \sqrt{3} + \log_6 12$$

対数の計算 (応用編)

$$\begin{aligned} & 2 \log_6 \sqrt{3} + \log_6 12 \\ = & \log_6 \sqrt{3}^2 + \log_6 12 \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & 2 \log_6 \sqrt{3} + \log_6 12 \\ = & \log_6 \sqrt{3}^2 + \log_6 12 \\ = & \log_6 3 + \log_6 12 \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & 2 \log_6 \sqrt{3} + \log_6 12 \\ = & \log_6 \sqrt{3}^2 + \log_6 12 \\ = & \log_6 3 + \log_6 12 \\ = & \log_6 (3 \times 12) \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & 2 \log_6 \sqrt{3} + \log_6 12 \\ = & \log_6 \sqrt{3}^2 + \log_6 12 \\ = & \log_6 3 + \log_6 12 \\ = & \log_6 (3 \times 12) \\ = & \log_6 36 \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & 2 \log_6 \sqrt{3} + \log_6 12 \\ = & \log_6 \sqrt{3}^2 + \log_6 12 \\ = & \log_6 3 + \log_6 12 \\ = & \log_6 (3 \times 12) \\ = & \log_6 36 = \log_6 6^2 \end{aligned}$$

対数の計算 (応用編)

$$\begin{aligned} & 2 \log_6 \sqrt{3} + \log_6 12 \\ = & \log_6 \sqrt{3}^2 + \log_6 12 \\ = & \log_6 3 + \log_6 12 \\ = & \log_6 (3 \times 12) \\ = & \log_6 36 = \log_6 6^2 = 2 \end{aligned}$$

底の変換

$$\log_{\star} \bigcirc = \frac{\log_{\triangle} \bigcirc}{\log_{\triangle} \star}$$

ただし $\star \neq 1$, $\triangle \neq 1$ の正の数字

$$\log_2 5 = \frac{\log_3 5}{\log_3 2}$$

$$\log_3 7 = \frac{\log_4 7}{\log_4 3}$$

底の変換

$$\log_{\star} \bigcirc = \frac{\log_{\triangle} \bigcirc}{\log_{\triangle} \star}$$

$$\log_9 27$$

底の変換

$$\log_{\star} \bigcirc = \frac{\log_{\triangle} \bigcirc}{\log_{\triangle} \star}$$

$$\log_9 27 = \frac{\log_3 27}{\log_3 9}$$

底の変換

$$\log_{\star} \bigcirc = \frac{\log_{\Delta} \bigcirc}{\log_{\Delta} \star}$$

$$\log_9 27 = \frac{\log_3 27}{\log_3 9} = \frac{\log_3 3^3}{\log_3 3^2}$$

底の変換

$$\log_{\star} \bigcirc = \frac{\log_{\Delta} \bigcirc}{\log_{\Delta} \star}$$

$$\begin{aligned} \log_9 27 &= \frac{\log_3 27}{\log_3 9} = \frac{\log_3 3^3}{\log_3 3^2} \\ &= \frac{3 \log_3 3}{2 \log_3 3} \end{aligned}$$

底の変換

$$\log_{\star} \bigcirc = \frac{\log_{\triangle} \bigcirc}{\log_{\triangle} \star}$$

$$\begin{aligned} \log_9 27 &= \frac{\log_3 27}{\log_3 9} = \frac{\log_3 3^3}{\log_3 3^2} \\ &= \frac{3 \log_3 3}{2 \log_3 3} = \frac{3 \times 1}{2 \times 1} \end{aligned}$$

底の変換

$$\log_{\star} \bigcirc = \frac{\log_{\Delta} \bigcirc}{\log_{\Delta} \star}$$

$$\begin{aligned} \log_9 27 &= \frac{\log_3 27}{\log_3 9} = \frac{\log_3 3^3}{\log_3 3^2} \\ &= \frac{3 \log_3 3}{2 \log_3 3} = \frac{3 \times 1}{2 \times 1} = \frac{3}{2} \end{aligned}$$