

■ 対数 log

氏名 _____

$$\star \blacktriangle = \bullet \iff \log_{\star} \bullet = \blacktriangle$$

例 1 $2^4 = 16 \iff \log_2 16 = 4$ $9^{\frac{1}{2}} = 3 \iff \log_9 3 = \frac{1}{2}$

1 次の等式を $\log_{\star} \bigcirc = \triangle$ の形で書きなさい ($\log_a M = p$)

- | | |
|--|-----------------------------|
| (1) $3^2 = 9$ | (2) $2^3 = 8$ |
| (3) $5^2 = 25$ | (4) $2^2 = 4$ |
| (5) $7^2 = 49$ | (6) $8^{\frac{1}{3}} = 2$ |
| (7) $\left(\frac{1}{2}\right)^2 = \frac{1}{4}$ | (8) $3^{-3} = \frac{1}{27}$ |

2 次の等式を $\star^{\triangle} = \bigcirc$ の形で書きなさい ($a^p = M$)

- | | |
|--|------------------------------------|
| (1) $\log_2 16 = 4$ | (2) $\log_5 125 = 3$ |
| (3) $\log_{11} 121 = 2$ | (4) $\log_3 243 = 5$ |
| (5) $\log_{\frac{1}{3}} \frac{1}{9} = 2$ | (6) $\log_{10} \frac{1}{100} = -2$ |
| (7) $\log_3 \sqrt{3} = \frac{1}{2}$ | (8) $\log_{10} 0.1 = -1$ |

$\log_5 1 = 0$ $\log_{\frac{2}{3}} 1 = 0$ | つまり $\log_{\star} 1 = 0$

$\log_3 3 = 1$ $\log_{\frac{2}{5}} \frac{2}{5} = 1$ | つまり $\log_{\star} \star = 1$

$\log_6 6^2 = 2$ $\log_5 5^{-2} = -2$ | つまり $\log_{\star} \star^{\blacktriangle} = \blacktriangle$

3 次の値を求めなさい。

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|-------------------|----------------------------|
| (1) $\log_5 5$ | (2) $\log_2 1$ |
| (3) $\log_2 8$ | (4) $\log_5 25$ |
| (5) $\log_7 7$ | (6) $\log_{\frac{1}{2}} 1$ |
| (7) $\log_3 27$ | (8) $\log_3 3$ |
| (9) $\log_{10} 1$ | (10) $\log_5 \frac{1}{5}$ |

$$\log_{\star} \bullet + \log_{\star} \blacktriangle = \log_{\star} (\bullet \times \blacktriangle)$$

$$\log_{\star} \bullet - \log_{\star} \blacktriangle = \log_{\star} \frac{\bullet}{\blacktriangle}$$

4 次の計算をしなさい。

- | | |
|---|---|
| (1) $\log_3 2 + \log_3 7$ | (2) $\log_5 2 + \log_5 3$ |
| (3) $\log_2 3 + \log_2 5$ | (4) $\log_7 12 - \log_7 3$ |
| (5) $\log_2 12 - \log_2 4$ | (6) $\log_{11} 36 - \log_{11} 4$ |
| (7) $\log_{10} 2 + \log_{10} 5$ | (8) $\log_3 18 - \log_3 2$ |
| (9) $\log_6 \sqrt{3} + \log_6 \sqrt{2}$ | (10) $\log_7 \sqrt{21} - \log_7 \sqrt{3}$ |

5 次の計算をなさい。

(1) $\log_5 6 - \log_5 2$

(2) $\log_7 2 + \log_7 4$

(3) $\log_3 3 + \log_3 5$

(4) $\log_6 2 + \log_6 3$

(5) $\log_2 6 + \log_2 \frac{1}{6}$

(6) $\log_2 24 - \log_2 3$

(7) $\log_7 2 + \log_7 6$

(8) $\log_2 28 - \log_2 7$

(9) $\log_5 10 - \log_5 2$

(10) $\log_3 2 - \log_3 \frac{1}{5}$

(11) $\log_3 6 + \log_3 \frac{3}{2}$

(12) $\log_3 2 + \log_3 6 - \log_3 4$

(13) $\log_2 18 - \log_2 6 + \log_2 5$

(14) $\log_4 8 - \log_4 3 + \log_4 6$

3 (1) 1 (2) 0 (3) 3 (4) 2 (5) 1 (6) 0 (7) 3 (8) 1 (9) 0 (10) -1 (11) $\log_3 14$ (12) $\log_5 6$ (13) $\log_2 15$ (14) $\log_7 4$ (15) $\log_2 3$ (16) $\log_{11} 9$ (17) 1 (18) 2 (19) $\frac{2}{1}$ (20) $\frac{2}{1}$

対数 #2 (1) $\log_3 9 = 2$ (2) $\log_2 8 = 3$ (3) $\log_5 25 = 2$ (4) $\log_2 4 = 2$ (5) $\log_7 49 = 2$ (6) $\log_8 2 = \frac{3}{3} = 1$ (7) $\log_{\frac{3}{2}} \frac{4}{3} = \frac{4}{3} \cdot \frac{2}{3} = \frac{8}{9}$ (8) $\log_3 \frac{27}{1} = -3$ (9) $2^4 = 16$ (10) $2^4 = 16$ (11) $2^4 = 16$ (12) $5^3 = 125$ (13) $11^2 = 121$ (14) $3^5 = 243$ (15) $\left(\frac{3}{1}\right)^2 = \frac{9}{1}$ (16) $10^{-2} = \frac{1}{100}$ (17) $3^{\frac{2}{3}} = \sqrt[3]{3^2} = \sqrt[3]{9}$ (18) $10^{-1} = 0.1$ (19) $\frac{2}{1}$ (20) $\frac{2}{1}$