

مثالها

(مثال) معادلات زیر را حل کنید.

$$1) \log_5 (x+1) = \frac{1}{2}$$

$$2) \log_2 (t+2) + \log_2 (t-2) = 1$$

$$3) \log_4 x + \log_4 (x-6) = 2$$

$$4) \log_{\frac{1}{10}} (x^2 - 1) = -1$$

$$5) \log (2x-5)^2 = 0$$

$$6) \frac{\log 2}{1 - \log x} = \frac{1}{3}$$

$$7) \log_{\log_3 x} 3 = 2$$

$$8) \log_{\frac{1}{3}} \left(-\frac{1}{x} \right) = 2$$

$$9) x^{\log_{\sqrt{x}} (x-2)} = 9$$

$$10) \log (x+1) + \log (x-1) = 1$$

$$11) (x+2) \log (x-1) = 0$$

$$12) \log_2 (|x+1| - 2) = -2$$

$$13) \log \frac{1}{2} + \log \frac{2}{3} + \dots + \log \frac{n}{n+1} = -2$$

$$14) 1 + \log_2 \sin x + (\log_2 \sin x)^2 + \dots = \frac{2}{3}$$

$$15) \log \sin x + \log \cos x + \log 2 = 0$$

$$16) \log (x-9) + 2 \log \sqrt{2x-1} = 2$$

$$17) x^{\log_x (x+3)^2} = 16$$

$$18) 7^{\log x} = 98 - x^{\log 7}$$

$$19) 16^{\log x^2} = 8$$

$$20) 3x^{\log_5 2} + 2^{\log_5 x} = 64$$

$$21) \log \sqrt{x} = \sqrt{\log x}$$

$$22) (\log x)^2 + \log x + 1 = \frac{7}{\log \frac{x}{10}}$$

$$23) \log x^2 + \log (-x) = 3 \quad ; \quad (x < 0)$$

$$24) x^{2 \log_x (x-2)} = 4$$

$$25) 5^{\log x} + x^{\log 5} = 50$$

$$26) 5^{\log x} - 3^{\log x-1} = 3^{\log x+1} - 5^{\log x-1}$$

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$$27) \frac{1}{4} x^{\frac{1}{2} \log_2 x} = 2^{\frac{1}{4} \log_2^2 x}$$

$$28) \sqrt{x^{\log \sqrt{x}}} = 10, x \in (0,1)$$

$$29) \log_3 x = \frac{1}{2} + \log_9 (4x + 15)$$

$$30) \left(\frac{2}{3} \log_9 27 \right) \log_2 (3+x) - \log_2 (7x+9) = \frac{2}{\log_8 16} - \frac{7}{2}$$

مثال) دستگاههای زیر را حل کنید.

$$31) \begin{cases} \log_2 (x+y) + |\log_2 (x-y)| = 3 \\ xy = 3 \end{cases}$$

$$32) \begin{cases} \sqrt[10]{2^x} \sqrt[5]{2^y} = \sqrt[3]{128} \\ \log (x+y) = \log 40 - \log (x-y) \end{cases}$$

مثال 33) به ازای هر مقدار a ، معادله زیر را حل کنید.

$$\left[1 + (a+2)^2 \right] \log_3 (2x - x^2) + \left[1 + (3a-1)^2 \right] \log_{11} \left(1 - \frac{x^2}{2} \right) = \log_3 (2x - x^2) + \log_{11} \left(1 - \frac{x^2}{2} \right)$$