Natural Logarithms … Set 1

Logarithmic Equations

Solve each equation.

1) $\log (n+9) = \log 4n$

2) $\log -5x = \log (10-3x)$

3) $\log (-3m-1) = \log (-4m-6)$

4) $\log a = \log (4a-9)$

5) $-4\log_3 -9m = -4$

6) $7\log_9 (x+8) = 7$

7) $-8 + \log_9 (m+1) = -8$

8) $-2\log_8 (a+1) = -8$

9) $\log_2 (a^2-6a) = \log_2 (10+3a)$

10) $\log_{15} (x^2+13) = \log_{15} (-9x-1)$

11) $\log_{19} (x^2+17) = \log_{19} (8x+2)$

12) $\log_{12} (m^2+73) = \log_{12} (17m+3)$

Answers

Solve each equation.

1) $\log (n+9) = \log 4n$

$\{3\}$

2) $\log -5x = \log (10-3x)$

$\{-5\}$

3) $\log (-3m-1) = \log (-4m-6)$

$\{-5\}$

4) $\log a = \log (4a-9)$

$\{3\}$

5) $-4\log_3 -9m = -4$

$\left\{-\frac{1}{3}\right\}$

6) $7\log_9 (x+8) = 7$

$\{1\}$

7) $-8 + \log_9 (m+1) = -8$

$\{0\}$

8) $-2\log_8 (a+1) = -8$

$\{4095\}$

9) $\log_2 (a^2-6a) = \log_2 (10+3a)$

$\{-1, 10\}$

10) $\log_{15} (x^2+13) = \log_{15} (-9x-1)$

$\{-7, -2\}$

11) $\log_{19} (x^2+17) = \log_{19} (8x+2)$

$\{5, 3\}$

12) $\log_{12} (m^2+73) = \log_{12} (17m+3)$

$\{7, 10\}$

Natural Logarithms … Set 1

13) $\log x - \log 6 = \log 15$

14) $\log 7 + \log x = 2$

15) $\log x + \log 2 = \log 2$

16) $\log x + \log 8 = 1$

17) $\log_4 (x^2 - 3) + \log_4 10 = 1$

18) $\log_7 2 + \log_7 (x - 5) = 2$

19) $\log_5 3 - \log_5 5x = 2$

20) $\log_3 (x^2 + 8) - \log_3 4 = 3$

21) $\ln (x + 7) + \ln (x + 3) = \ln 77$

22) $\ln (x + 1) - \ln (x - 1) = 3$

23) $\ln (x + 2) - \ln (x - 1) = 1$

24) $\ln (x + 3) - \ln (x + 2) = 5$

Answers

13) $\log x - \log 6 = \log 15$

$\{90\}$

14) $\log 7 + \log x = 2$

$\left\{\frac{100}{7}\right\}$

15) $\log x + \log 2 = \log 2$

$\{1\}$

16) $\log x + \log 8 = 1$

$\left\{\frac{5}{4}\right\}$

17) $\log_4 (x^2 - 3) + \log_4 10 = 1$

$\left\{\frac{\sqrt{85}}{5}, -\frac{\sqrt{85}}{5}\right\}$

18) $\log_7 2 + \log_7 (x - 5) = 2$

$\left\{\frac{59}{2}\right\}$

19) $\log_5 3 - \log_5 5x = 2$

$\left\{\frac{3}{125}\right\}$

20) $\log_3 (x^2 + 8) - \log_3 4 = 3$

$\{10, -10\}$

21) $\ln (x + 7) + \ln (x + 3) = \ln 77$

$\{4\}$

22) $\ln (x + 1) - \ln (x - 1) = 3$

$\left\{\frac{-1 - e^3}{1 - e^3}\right\}$

23) $\ln (x + 2) - \ln (x - 1) = 1$

$\left\{\frac{-2 - e}{1 - e}\right\}$

24) $\ln (x + 3) - \ln (x + 2) = 5$

$\left\{\frac{-3 + 2e^5}{1 - e^5}\right\}$