

## Logarithmic Equations

**Solve each equation.**

1)  $\log 5x = \log (2x + 9)$

2)  $\log (10 - 4x) = \log (10 - 3x)$

3)  $\log (4p - 2) = \log (-5p + 5)$

4)  $\log (4k - 5) = \log (2k - 1)$

5)  $\log (-2a + 9) = \log (7 - 4a)$

6)  $2\log_7 -2r = 0$

7)  $-10 + \log_3 (n + 3) = -10$

8)  $-2\log_5 7x = 2$

9)  $\log -m + 2 = 4$

10)  $-6\log_3 (x - 3) = -24$

11)  $\log_{12} (v^2 + 35) = \log_{12} (-12v - 1)$

12)  $\log_9 (-11x + 2) = \log_9 (x^2 + 30)$

$$13) \log(16 + 2b) = \log(b^2 - 4b)$$

$$14) \ln(n^2 + 12) = \ln(-9n - 2)$$

$$15) \log x + \log 8 = 2$$

$$16) \log x - \log 2 = 1$$

$$17) \log 2 + \log x = 1$$

$$18) \log x + \log 7 = \log 37$$

$$19) \log_8 2 + \log_8 4x^2 = 1$$

$$20) \log_9(x + 6) - \log_9 x = \log_9 2$$

$$21) \log_6(x + 1) - \log_6 x = \log_6 29$$

$$22) \log_5 6 + \log_5 2x^2 = \log_5 48$$

$$23) \ln 2 - \ln(3x + 2) = 1$$

$$24) \ln(-3x - 1) - \ln 7 = 2$$

$$25) \ln(x - 3) - \ln(x - 5) = \ln 5$$

$$26) \ln(4x + 1) - \ln 3 = 5$$

## Logarithmic Equations

**Solve each equation.**

1)  $\log 5x = \log (2x + 9)$

 $\{3\}$ 

2)  $\log (10 - 4x) = \log (10 - 3x)$

 $\{0\}$ 

3)  $\log (4p - 2) = \log (-5p + 5)$

 $\left\{\frac{7}{9}\right\}$ 

4)  $\log (4k - 5) = \log (2k - 1)$

 $\{2\}$ 

5)  $\log (-2a + 9) = \log (7 - 4a)$

 $\{-1\}$ 

6)  $2\log_7 -2r = 0$

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

7)  $-10 + \log_3 (n + 3) = -10$

 $\{-2\}$ 

8)  $-2\log_5 7x = 2$

 $\left\{\frac{1}{35}\right\}$ 

9)  $\log -m + 2 = 4$

 $\{-100\}$ 

10)  $-6\log_3 (x - 3) = -24$

 $\{84\}$ 

11)  $\log_{12} (v^2 + 35) = \log_{12} (-12v - 1)$

 $\{-6\}$ 

12)  $\log_9 (-11x + 2) = \log_9 (x^2 + 30)$

 $\{-7, -4\}$

13)  $\log(16 + 2b) = \log(b^2 - 4b)$

$\{8, -2\}$

14)  $\ln(n^2 + 12) = \ln(-9n - 2)$

$\{-2, -7\}$

15)  $\log x + \log 8 = 2$

$\left\{\frac{25}{2}\right\}$

16)  $\log x - \log 2 = 1$

$\{20\}$

17)  $\log 2 + \log x = 1$

$\{5\}$

18)  $\log x + \log 7 = \log 37$

$\left\{\frac{37}{7}\right\}$

19)  $\log_8 2 + \log_8 4x^2 = 1$

$\{1, -1\}$

20)  $\log_9(x + 6) - \log_9 x = \log_9 2$

$\{6\}$

21)  $\log_6(x + 1) - \log_6 x = \log_6 29$

$\left\{\frac{1}{28}\right\}$

22)  $\log_5 6 + \log_5 2x^2 = \log_5 48$

$\{2, -2\}$

23)  $\ln 2 - \ln(3x + 2) = 1$

$\left\{\frac{2 - 2e}{3e}\right\}$

24)  $\ln(-3x - 1) - \ln 7 = 2$

$\left\{\frac{-7e^2 - 1}{3}\right\}$

25)  $\ln(x - 3) - \ln(x - 5) = \ln 5$

$\left\{\frac{11}{2}\right\}$

26)  $\ln(4x + 1) - \ln 3 = 5$

$\left\{\frac{3e^5 - 1}{4}\right\}$