

Log Equations Part 2

Solve each equation.

1) $\log_3 2a = \log_3 (3-a)$

$$\begin{array}{r} 2a = 3-a \\ +a \quad +a \\ \hline 3a = 3 \end{array}$$

$$\begin{array}{l} \nearrow 3a = 3 \\ \frac{3}{3} \quad \frac{3}{3} \\ \boxed{a = 1} \end{array}$$

2) $\log_3 (5p-9) = \log_3 (3p-3)$

3) $\log_6 (-4k-3) = \log_6 (k+7)$

4) $\log (6-4n) = \log (n+4)$

5) $\log_5 (-3p-1) = \log_5 -2p$

$$\begin{array}{r} -3p-1 = -2p \\ +3p \quad +3p \\ \hline -1 = p \end{array}$$

6) $\log_{19} (3n+8) = \log_{19} 4n$

7) $\log_{20} (3v-6) = \log_{20} (10-v)$

8) $\log (-4x-6) = \log -2x$

9) $\log_{10} -40x = 1$

10) $\log_5 \frac{x+10}{6} = 1$

$$\textcircled{5^1} = \frac{x+10}{6}$$

$$\frac{5}{1} = \frac{x+10}{6}$$

12) $\log_8 -6x = 2$

$$\begin{array}{r} \nearrow x+10 = 30 \\ -10 \quad -10 \\ \hline \boxed{x = 20} \end{array}$$

11) $\log_7 -40x = 1$

$$\textcircled{7^1} = -40x$$

$$7 = -40x$$

$$\begin{array}{l} \nearrow 7 = -40x \\ \frac{7}{-40} = \frac{-40x}{-40} \\ \boxed{\frac{-7}{40} = x} \end{array}$$

13) $\log_9 (4x+20) = 1$

14) $\log_5 (3x+30) = 3$

$$\textcircled{5^3} = 3x+30$$

$$125 = 3x+30$$

$$\begin{array}{r} \nearrow 125 = 3x+30 \\ -30 \quad -30 \\ \hline \frac{95}{3} = \frac{3x}{3} \\ \boxed{x = \frac{95}{3}} \end{array}$$

15) $\log_6 -45x = 4$

16) $\log_8 (2x-2) = 2$