

18.4 – Solving Logarithms

Solve each logarithmic equation.

1. $\log_3 \underline{20} = \log_3 \underline{4x}$

$$\begin{aligned} 20 &= 4x \\ 5 &= x \end{aligned}$$

2. $\log_5 \underline{2x + 6} = \log_5 \underline{12}$

$$\begin{aligned} 2x + 6 &= 12 \\ 2x &= 6 \\ x &= 3 \end{aligned}$$

3. $\log_{10} \underline{x - 7} = \log_{10} \underline{15}$

$$\begin{aligned} x - 7 &= 15 \\ x &= 22 \end{aligned}$$

Sometimes we need to use properties of logarithms to help us solve the equation.

4. $\log_5 6x - \log_5 3 = \log_5 \underline{2}$

$$\log_5 \frac{6x}{3} = \log_5 \underline{2}$$

$$\frac{6x}{3} = 2$$

$$\begin{aligned} 2x &= 2 \\ x &= 1 \end{aligned}$$

5. $2 \log x = \log 16$

$$\log \underline{x^2} = \log \underline{16}$$

$$x^2 = 16$$

$$x = \pm 4$$