

Study Guide

Solving Multi-Step Equations

Some equations require more than one step to solve. To solve a problem that has more than one step, the best strategy is to undo the operations in reverse order. Always check your solution.

Example 1: Solve $3x - 8 = 31$.

$$\begin{aligned} 3x - 8 &= 31 \\ 3x - 8 + 8 &= 31 + 8 \\ 3x &= 39 \\ \frac{3x}{3} &= \frac{39}{3} \\ x &= 13 \end{aligned}$$

Check: $3x - 8 = 31$

$$\begin{aligned} 3(13) - 8 &\stackrel{?}{=} 31 \\ 39 - 8 &\stackrel{?}{=} 31 \\ 31 &= 31 \checkmark \end{aligned}$$

Example 2: Solve $\frac{x}{4} + 6 = 12$.

$$\begin{aligned} \frac{x}{4} + 6 &= 12 \\ \frac{x}{4} + 6 - 6 &= 12 - 6 \\ \frac{x}{4} &= 6 \\ 4 \cdot \frac{x}{4} &= 4 \cdot 6 \\ x &= 24 \end{aligned}$$

Check: $\frac{x}{4} + 6 = 12$

$$\begin{aligned} \frac{24}{4} + 6 &\stackrel{?}{=} 12 \\ 6 + 6 &\stackrel{?}{=} 12 \\ 12 &= 12 \checkmark \end{aligned}$$

Solve each equation. Show the steps

1. $6y - 4 = 50$

2. $-8x - 2 = 38$

3. $-15 = -12n + 9$

4. $-2m + 6 = 22$

5. $-4y - 8 = 30$

6. $-1.5x + 6 = -54$

7. $8.2y + 4 = 65.5$

8. $-1.5 = 3w + 6$

9. $-8 = -2.5x + 5$

10. $\frac{x}{2} + 7 = 9$

11. $\frac{x}{3} - 12 = -2$

12. $\frac{x}{-6} - 12 = 2$

13. $3x + 7 = 7$

14. $-8 = 1.5y + 4$

15. $\frac{y}{2} + 2 = 25$