

Study Guide

Solving Multi-Step Equations

When solving some equations you must perform more than one operation on both sides. First, determine what operations have been done to the variable. Then undo these operations in the reverse order.

Example 1: How would you solve $\frac{n}{3} - 7 = 28$?

$$\frac{n}{3} - 7 = 28$$

First, n was divided by 3. } To solve, first add 7 to each side.
Then 7 was subtracted. } Then multiply each side by 3.

Procedure for Solving a Two-Step Equation	<ol style="list-style-type: none"> 1. Undo any indicated additions or subtractions. 2. Undo any indicated multiplications or divisions involving the variable.
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Example 2: $5x + 3 = 23$

Addition of 3 is indicated.

Check:

$$5x + 3 - 3 = 23 - 3 \quad \text{Therefore, subtract 3 from each side.}$$

$$5x + 3 = 23$$

$$5(4) + 3 \stackrel{?}{=} 23$$

$$5x = 20$$

Multiplication by 5 is also indicated.

$$20 + 3 \stackrel{?}{=} 23$$

$$\frac{5x}{5} = \frac{20}{5}$$

Therefore, divide each side by 5.

$$23 = 23 \quad \checkmark$$

$$x = 4$$

Solve each equation. Then check your solution.

1. $5z + 16 = 51$

2. $14n - 8 = 34$

1. $0.6x - 1.5 = 1.8$

4. $\frac{4b + 8}{-2} = 10$

5. $16 = \frac{d - 12}{14}$

6. $8 + \frac{3n}{12} = 13$

7. $\frac{7}{8}p - 4 = 10$

8. $\frac{g}{-5} + 3 = -13$

9. $-4 = \frac{7x - (-1)}{-8}$

Define a variable, write an equation, and solve each problem. Then check your solution.

10. Find three consecutive integers whose sum is 96.

11. Find two consecutive odd integers whose sum is 176.