

Lesson 3-3

Example 1 Solving Equations by Subtracting

Solve $x + 4 = -3$. Check your solution.

| | |
|----------------------|--------------------------------|
| $x + 4 = -3$ | Write the equation. |
| $x + 4 - 4 = -3 - 4$ | Subtract 4 from each side. |
| $x + 0 = -7$ | $4 - 4 = 0$; $-3 - 4 = -7$ |
| $x = -7$ | Identity Property; $x + 0 = x$ |

To check your solution, replace x with -7 in the original equation.

| | |
|---------------------------|---|
| CHECK $x + 4 = -3$ | Write the equation. |
| $-7 + 4 = -3$ | Check to see whether this sentence is true. |
| $-3 = -3$ ✓ | The sentence is true. |

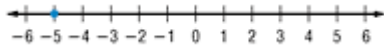
The solution is -7 .

Example 2 Graph Solutions of Equations

Graph the solution of $9 + x = 4$ on a number line.

| | |
|---------------------|---------------------------------------|
| $9 + x = 4$ | Write the equation. |
| $x + 9 = 4$ | Commutative Property; $9 + x = x + 9$ |
| $x + 9 - 9 = 4 - 9$ | Subtract 9 from each side. |
| $x = -5$ | Simplify. |

The solution is -5 . To graph the solution, draw a dot at -5 on a number line.



Example 3 Solve Equations by Adding

Solve $-3 + x = 18$.

| | |
|-------------------------|---|
| $-3 + x = 18$ | Write the equation. |
| $x - 3 = 18$ | Commutative Property |
| $x + (-3) = 18$ | Rewrite $x - 3$ as $x + (-3)$. |
| $x + (-3) + 3 = 18 + 3$ | Add 3 to each side. |
| $x + 0 = 21$ | Additive Inverse Property; $(-3) + 3 = 0$. |
| $x = 21$ | Identity Property; $x + 0 = x$ |

The solution is 21. Check your solution.

Example 4 Use an Equation to a Solve Problem

BASEBALL Dave had 12 fewer hits during the baseball season than Peter. Dave had 73 hits during the season. Write and solve an equation to find the number of hits Peter had during the season.

Words Dave had 12 fewer hits than Peter.

Variables Let x = the number of hits Peter had during the season.

Equation Dave's number of hits was 12 fewer than Peter's number of hits.

$$73 = x - 12$$

Solve the equation.

$$73 = x - 12$$

Think of $x - 12$ as $x + (-12)$.

$$73 + 12 = x - 12 + 12$$

Add 12 to each side.

$$85 = x$$

Simplify.

Peter had 85 hits during the season.

Example 5 Solve Equations

Multiple Choice Test Item

What value of x makes $x + 7 = 2$ a true statement?

- A. 9 B. 5 C. -5 D. 14

Read the Test Item To find the value of x , solve the equation.

Solve the Test Item

$$x + 7 = 2$$

Write the equation.

$$x + 7 - 7 = 2 - 7$$

Subtract 7 from each side.

$$x = -5$$

Simplify.

The answer is C.