

3.1 Solve One-Step Equations

TEKS A.4.A, A.7.B

Before

You solved equations using mental math.

Now

You will solve one-step equations using algebra.

Why?

So you can determine a weight limit, as in Ex. 56.



Key Vocabulary

- **inverse operations**
- **equivalent equations**
- **reciprocal**, p. 915

Inverse operations are two operations that undo each other, such as addition and subtraction. When you perform the same inverse operation on each side of an equation, you produce an *equivalent equation*. **Equivalent equations** are equations that have the same solution(s).

KEY CONCEPT

For Your Notebook

Addition Property of Equality

Words Adding the same number to each side of an equation produces an equivalent equation.

Algebra If $x - a = b$, then $x - a + a = b + a$, or $x = b + a$.

Subtraction Property of Equality

Words Subtracting the same number from each side of an equation produces an equivalent equation.

Algebra If $x + a = b$, then $x + a - a = b - a$, or $x = b - a$.

EXAMPLE 1 Solve an equation using subtraction

Solve $x + 7 = 4$.

$$x + 7 = 4$$

Write original equation.

$$x + 7 - 7 = 4 - 7$$

Use subtraction property of equality:
Subtract 7 from each side.

$$x = -3$$

Simplify.

▶ The solution is -3 .

CHECK Substitute -3 for x in the original equation.

$$x + 7 = 4$$

Write original equation.

$$-3 + 7 \stackrel{?}{=} 4$$

Substitute -3 for x .

$$4 = 4 \checkmark$$

Simplify. Solution checks.

AVOID ERRORS

To obtain an equivalent equation, be sure to subtract the same number from each side.