# Simplifying Equations

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Distribute 3 into $(x - 4)$:

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Collect common terms:

$$3x - 12 = 9 - 7x$$

# Addition property of equality

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## Division property of equality

You can divide both sides of an equation by anything (except zero).
If $x = y$, then $x/a = y/a$ for any $a \neq 0$.

# Simplifying Linear Equations

$$ax = b$$

**Example 1:**

$$3x - 4 = 5$$

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$$ax = b$$

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$$3x - 4 = 5$$

Add 4 to both sides:

$$3x = 9$$

# Simplifying Linear Equations

$$ax = b$$

**Example 1:**

$$3x - 4 = 5$$

Add 4 to both sides:

$$3x = 9$$

**Example 2:**

$$3x = 8 - x$$

# Simplifying Linear Equations

$$ax = b$$

**Example 1:**

$$3x - 4 = 5$$

Add 4 to both sides:

$$3x = 9$$

**Example 2:**

$$3x = 8 - x$$

Add $x$ to both sides:

$$4x = 8$$

# Simplifying Linear Equations

$$ax = b$$

**Example 3:**

$$3x - 4 = x + 2$$

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$$3x - 4 = x + 2$$

Add 4 to both sides:

$$3x = x + 6$$

# Simplifying Linear Equations

$$ax = b$$

**Example 3:**

$$3x - 4 = x + 2$$

Add 4 to both sides:

$$3x = x + 6$$

Subtract $x$ from both sides:

$$2x = 6$$

# Simplifying Linear Equations

$$ax = b$$

**Example 3:**

$$3x - 4 = x + 2$$

Add 4 to both sides:

$$3x = x + 6$$

Subtract $x$ from both sides:

$$2x = 6$$

There is more than one right way to simplify an equation, but some choices require fewer steps than others.