3.3 Solve Multi-Step Equations

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

Before You solved one-step and two-step equations.

Now You will solve multi-step equations.

Why? So you can solve a problem about lifeguarding, as in Ex. 40.

Key Vocabulary
- **like terms,** *p. 97*
- **distributive property,** *p. 96*
- **reciprocal,** *p. 915*

Solving a linear equation may take more than two steps. Start by simplifying one or both sides of the equation, if possible. Then use inverse operations to isolate the variable.

EXAMPLE 1 Solve an equation by combining like terms

Solve $8x - 3x - 10 = 20$.

$8x - 3x - 10 = 20$	Write original equation.
$5x - 10 = 20$	Combine like terms.
$5x - 10 + 10 = 20 + 10$	Add 10 to each side.
$5x = 30$	Simplify.
$\frac{5x}{5} = \frac{30}{5}$	Divide each side by 5.
$x = 6$	Simplify.

EXAMPLE 2 Solve an equation using the distributive property

Solve $7x + 2(x + 6) = 39$.

Solution

When solving an equation, you may feel comfortable doing some steps mentally. Method 2 shows a solution where some steps are done mentally.

REVIEW PROPERTIES
For help with using the distributive property, see p. 96.

METHOD 1 Show All Steps

$7x + 2(x + 6) = 39$

$7x + 2x + 12 = 39$

$9x + 12 = 39$

$9x + 12 - 12 = 39 - 12$

$9x = 27$

$\frac{9x}{9} = \frac{27}{9}$

$x = 3$

METHOD 2 Do Some Steps Mentally

$7x + 2(x + 6) = 39$

$7x + 2x + 12 = 39$

$9x + 12 = 39$

$9x = 27$

$x = 3$