

1-3 Solving Equations**What You'll Learn**

Scan the text in Lesson 1-3. Write two facts you learned about equations as you scanned the text.

1. _____

2. _____

Active Vocabulary

New Vocabulary Define the following terms from this lesson.

open sentence ▶

equation ▶

solution ▶

Vocabulary Link *Properties of Equality* can be explained in non-mathematical terms. For each description, name the *Property of Equality* that is described.

The word "little" means the same as the word "small". Therefore, when I read the word "small" I can replace it with the word "little."

The word "little" means the same as the word "small." The word "small" means the same as the word "tiny." Therefore, the word "little" means the same as the word "tiny."

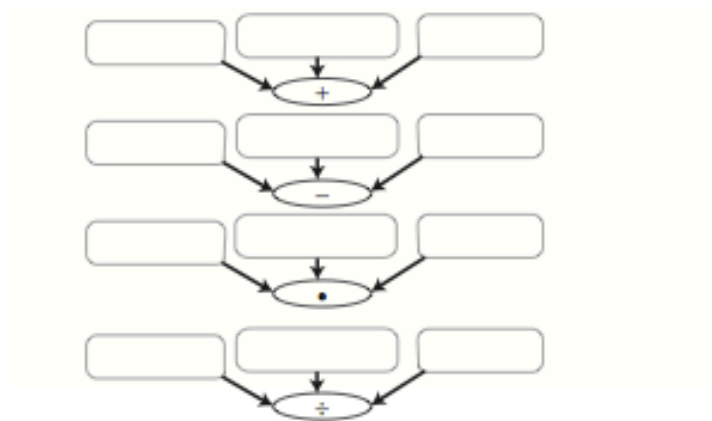
Lesson 1-3 (continued)

Main Idea

Verbal Expressions and Algebraic Expressions
p. 18

Details

List verbal expressions that would translate into each operation.



Properties of Equality
pp. 19–21

Solve the equation using the steps listed as a guide.

Equation	Step
$2(q - 3) + 5q = 8(q - 1)$	Original equation
	Distributive Property
	Simplify.
	Addition Property of Equality
	Addition Property of Equality
	Division Property of Equality
	Check.

Helping You Remember

How can the words *reflection* and *symmetry* help you remember and distinguish between the reflexive and symmetric properties of equality? Think about how these words are used in geometry.

1-3 Skills Practice**Solving Equations**

Write an algebraic expression to represent each verbal expression.

- 4 times a number, increased by 7
- 8 less than 5 times a number
- 6 times the sum of a number and 5
- the product of 3 and a number, divided by 9
- 3 times the difference of 4 and a number
- the product of -11 and the square of a number

Write a verbal sentence to represent each equation.

- $n - 8 = 16$
- $8 + 3x = 5$
- $b + 3 = b^2$
- $\frac{y}{3} = 2 - 2y$

Name the property illustrated by each statement.

- If $a = 0.5b$, and $0.5b = 10$, then $a = 10$.
- If $d + 1 = f$, then $d = f - 1$.
- If $-7x = 14$, then $14 = -7x$.
- If $(8 + 7)r = 30$, then $15r = 30$.

Solve each equation. Check your solution.

- $4m + 2 = 18$
- $x + 4 = 5x + 2$
- $3t = 2t + 5$
- $-3b + 7 = -15 + 2b$
- $-5x = 3x - 24$
- $4v + 20 - 6 = 34$
- $a - \frac{2a}{5} = 3$
- $2.2n + 0.8n + 5 = 4n$

Solve each equation or formula for the specified variable.

- $I = prt$, for p
- $y = \frac{1}{4}x - 12$, for x
- $A = \frac{x+y}{2}$, for y
- $A = 2\pi r^2 + 2\pi rh$, for h

1-3 Practice**Solving Equations**

Write an algebraic expression to represent each verbal expression.

- 2 more than the quotient of a number and 5
- the sum of two consecutive integers
- 5 times the sum of a number and 1
- 1 less than twice the square of a number

Write a verbal sentence to represent each equation.

- $5 - 2x = 4$
- $3y = 4y^3$
- $3c = 2(c - 1)$
- $\frac{m}{5} = 3(2m + 1)$

Name the property illustrated by each statement.

- If $t - 13 = 52$, then $52 = t - 13$.
- If $8(2q + 1) = 4$, then $2(2q + 1) = 1$.
- If $h + 12 = 22$, then $h = 10$.
- If $4m = -15$, then $-12m = 45$.

Solve each equation. Check your solution.

- $14 = 8 - 6r$
- $9 + 4n = -59$
- $\frac{3}{4} - \frac{1}{2}n = \frac{5}{8}$
- $\frac{5}{6}s + \frac{3}{4} = \frac{11}{12}$
- $-1.6r + 5 = -7.8$
- $6x - 5 = 7 - 9x$
- $5(6 - 4v) = v + 21$
- $6y - 5 = -3(2y + 1)$

Solve each equation or formula for the specified variable.

- $E = mc^2$, for m
- $c = \frac{2d + 1}{3}$, for d
- $h = vt - gt^2$, for v
- $E = \frac{1}{2}Iw^2 + U$, for I

25. GEOMETRY The length of a rectangle is twice the width. Find the width if the perimeter is 60 centimeters. Define a variable, write an equation, and solve the problem.

26. GOLF Luis and three friends went golfing. Two of the friends rented clubs for \$6 each. The total cost of the rented clubs and the green fees for each person was \$76. What was the cost of the green fees for each person? Define a variable, write an equation, and solve the problem.