

# 1.1

## Solving Simple Equations

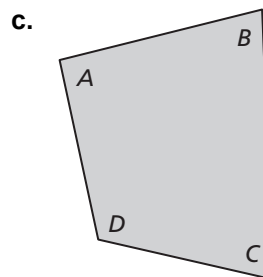
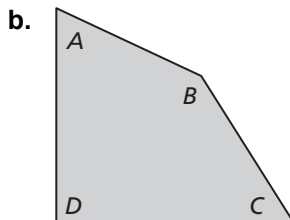
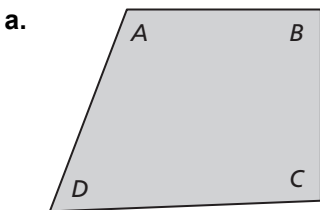
For use with Exploration 1.1

**Essential Question** How can you use simple equations to solve real-life problems?

### 1 EXPLORATION: Measuring Angles

Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

**Work with a partner.** Use a protractor to measure the angles of each quadrilateral. Complete the table to organize your results. (The notation  $m\angle A$  denotes the measure of angle  $A$ .) How precise are your measurements?



Quadrilateral	$m\angle A$ (degrees)	$m\angle B$ (degrees)	$m\angle C$ (degrees)	$m\angle D$ (degrees)	$m\angle A + m\angle B$ $+ m\angle C + m\angle D$
a.					
b.					
c.					

### 2 EXPLORATION: Making a Conjecture

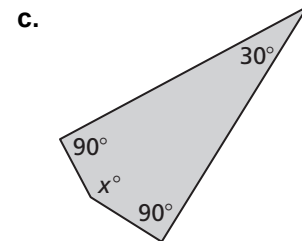
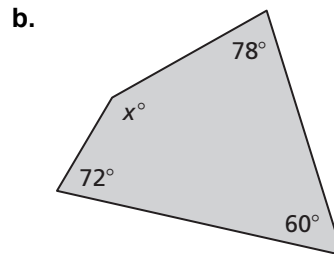
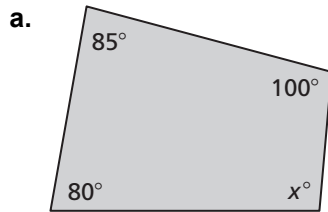
Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

**Work with a partner.** Use the completed table in Exploration 1 to write a conjecture about the sum of the angle measures of a quadrilateral. Draw three quadrilaterals that are different from those in Exploration 1 and use them to justify your conjecture.

**1.1 Solving Simple Equations (continued)****3 EXPLORATION: Applying Your Conjecture**

Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

**Work with a partner.** Use the conjecture you wrote in Exploration 2 to write an equation for each quadrilateral. Then solve the equation to find the value of  $x$ . Use a protractor to check the reasonableness of your answer.

**Communicate Your Answer**

- How can you use simple equations to solve real-life problems?
- Draw your own quadrilateral and cut it out. Tear off the four corners of the quadrilateral and rearrange them to affirm the conjecture you wrote in Exploration 2. Explain how this affirms the conjecture.

# 1.1

## Notetaking with Vocabulary

For use after Lesson 1.1

In your own words, write the meaning of each vocabulary term.

conjecture

rule

theorem

equation

linear equation in one variable

solution

inverse operations

equivalent equations

### Core Concepts

#### Addition Property of Equality

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

**Algebra** If  $a = b$ , then  $a + c = b + c$ .

**Notes:**

**1.1** Notetaking with Vocabulary (continued)**Subtraction Property of Equality**

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

**Algebra** If  $a = b$ , then  $a - c = b - c$ .

**Notes:**

**Multiplication Property of Equality**

**Words** Multiplying each side of an equation by the same nonzero number produces an equivalent equation.

**Algebra** If  $a = b$ , then  $a \cdot c = b \cdot c$ ,  $c \neq 0$ .

**Notes:**

**Division Property of Equality**

**Words** Dividing each side of an equation by the same nonzero number produces an equivalent equation.

**Algebra** If  $a = b$ , then  $a \div c = b \div c$ ,  $c \neq 0$ .

**Notes:**

**Four Step Approach to Problem Solving**

- 1. Understand the Problem** What is the unknown? What information is being given? What is being asked?
- 2. Make a Plan** This plan might involve one or more of the problem-solving strategies shown on the following page.
- 3. Solve the Problem** Carry out your plan. Check that each step is correct.
- 4. Look Back** Examine your solution. Check that your solution makes sense in the original statement of the problem.

**Notes:**

**1.1 Notetaking with Vocabulary (continued)****Common Problem-Solving Strategies**

- |                     |                                |
|---------------------|--------------------------------|
| Use a verbal model. | Guess, check, and revise.      |
| Draw a diagram.     | Sketch a graph or number line. |
| Write an equation.  | Make a table.                  |
| Look for a pattern. | Make a list.                   |
| Work backward.      | Break the problem into parts.  |

**Notes:****Extra Practice**

In Exercises 1–9, solve the equation. Justify each step. Check your solution.

1.  $w + 4 = 16$

2.  $x + 7 = -12$

3.  $-15 + w = 6$

4.  $z - 5 = 8$

5.  $-2 = y - 9$

6.  $7q = 35$

7.  $4b = -52$

8.  $3 = \frac{q}{11}$

9.  $\frac{n}{-2} = -15$

10. A coupon subtracts \$17.95 from the price  $p$  of a pair of headphones. You pay \$71.80 for the headphones after using the coupon. Write and solve an equation to find the original price of the headphones.

11. After a party, you have  $\frac{2}{5}$  of the brownies you made left over. There are 16 brownies left. How many brownies did you make for the party?