Warm-Up

Write each phrase as a mathematical expression.

1. the sum of 6 less than a number and 3

2. the distance between a number and 2 on the number line
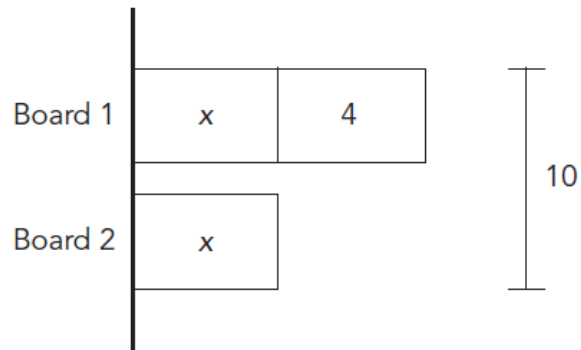
In the Dog House

To build a dog house, you and your friends cut a 10-foot board into two boards. One of the boards is 4 feet longer than the other.
How long is each board?

1. Explain what each part of the model represents in terms of this situation.
a. What does the number 4 represent?

b. What does the variable x represent?

c. What does the number 10 represent?

2. Use the model to explain what each expression means in terms of this situation.
a. What does the expression 2x represent?

b. What does the expression 2x + 4 represent?

3. How long is each board?

Fido and Jet are two small dogs. Fido weighs exactly 10 pounds more than Jet. Together, they weigh exactly 46 pounds.

1. Draw a bar model to represent this situation. Let j equal Jet's weight.

2. Use your model to explain what each expression represents in terms of the situation.
a. What does the expression 46 represent?

b. What does the expression 2j represent?

c. What does the expression j + 10 represent?

d. What does the expression 2j + 10 represent?

3. How much does each dog weigh? Use the model to help you solve the problem.

You and your friends Jamal and Carla decide to make some money during summer vacation by building and selling dog houses. To get the business started, Jamal contributes $25.55, and Carla contributes $34.45 to buy equipment and materials. You all agree that each person will earn the same amount of money after Jamal and Carla get back what they invested. Your business earns a total of $450.

1. Draw a bar model to represent this situation.

2. Compare your models with your classmates' models.
a. What unknown quantity or quantities are represented in the model?

b. What algebraic expressions can you write to represent different parts of the situation?

You can represent the model you drew as a mathematical sentence using operations and an equals sign. An equation is a mathematicalsentence created by placing an equals sign (5) between two expressions.

3. Write an equation to show that the total amount that you, Carla, and Jamal earn, including the amounts Carla and Jamal invested, is equal to $450.

4. Describe how the different parts of the equation are represented in the model and in the situation.

5. How much money does each person get at the end of the summer? Use your model to solve the problem.

6. Explain how the solution is represented in the equation.

LESSON 8.1a
Picture Algebra

Objective   Modeling Equations as Equal Expressions

Practice

Directions: For questions 1 through 8, identify the part or parts of each sentence that indicates one or more operations. Then choose a variable to represent the unknown number and write the correct equation.

1. Four less than a number is equal to seventeen.

_____

2. Ten times a number equals negative thirty.

_____

3. A number increased by three is twenty-five.

_____

4. Twice a number is twelve.

_____

5. The quotient of a number and negative nine is six.

_____

6. Five more than three times a number is thirty-eight.

_____

7. The sum of a number and eleven, multiplied by one-third is thirteen.

_____

8. The difference between triple a number and fifteen is twenty-one.

_____