Lesson 3: Writing Products as Sums and Sums as Products

Classwork

Opening Exercise

Solve the problem using a tape diagram. A sum of money was shared between George and Brian in a ratio of . If the sum of money was , how much did George get?

**Example 1**

Represent using a tape diagram.

Represent using a tape diagram.

Draw a rectangular array for .

Draw an array for .

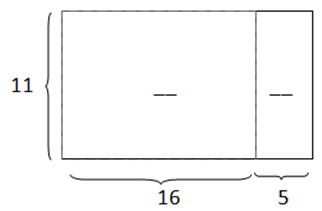
Exercise 1

**Key Terms**

**Distributive Property:** The distributive property can be written as the identity

for all numbers and

Determine the area of each region using the distributive property.

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**Example 2**

Draw a tape diagram to represent each expression.

**Example 3**

Find an equivalent expression by modeling with a rectangular array and applying the distributive property to the expression .

Exercise 2

For parts (a) and (b), draw an array for each expression and apply the distributive property to expand each expression. Substitute the given numerical values to demonstrate equivalency.

* 1. ,
  2. ,

For parts (c) and (d), apply the distributive property. Substitute the given numerical values to demonstrate equivalency.

* 1. ,
  2. ,

**Example 4**

Rewrite the expression in standard form using the distributive property.

Exercise 3

Rewrite the expressions as a sum.

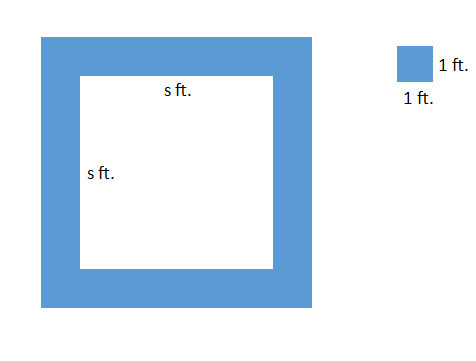
**Example 5**

Expand the expression

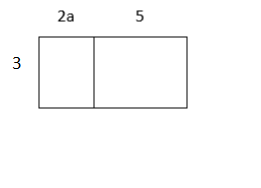
Exercise 4

Expand the expression from a product to a sum by removing grouping symbols using an area model and the repeated use of distributive property: .

**Example 6**

A square fountain area with side length is bordered by a single row of square tiles as shown. Express the total number of tiles needed in terms of three different ways.

Problem Set

1. 1. **** Write two equivalent expressions that represent the rectangular array below.
   2. Verify informally that the two equations are equivalent using substitution.
2. You and your friend made up a basketball shooting game. Every shot made from the free throw line is worth points, and every shot made from the half-court mark is worth points. Write an equation that represents the total amount of points, , if represents the number of shots made from the free throw line, and represents the number of shots made from half-court. Explain the equation in words.
3. Use a rectangular array to write the products in standard form.
4. Use the distributive property to write the products in standard form.

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1. Write the expression in standard form by expanding and collecting like terms.