

2.2

The Distributive Property

Goal: Use the distributive property.

Vocabulary

Equivalent numerical expressions:

Equivalent variable expressions:

The Distributive Property

Algebra $a(b + c) = ab + ac$

$$(b + c)a = ba + ca$$

$$a(b - c) = ab - ac$$

$$(b - c)a = ba - ca$$

Numbers $4(6 + 3) =$

$$(6 + 3)4 =$$

$$5(7 - 2) =$$

$$(7 - 2)5 =$$

Example 1

Using the Distributive Property

Crafts You are buying beads for a craft project. You need gold, silver, and white beads. A bag of each type of bead costs \$3.99. Use the distributive property and mental math to find the total cost of the beads.

Solution

$$\text{Total cost} = 3(3.99)$$

$$= 3(\square - \square)$$

$$= 3(\square) - 3(\square)$$

$$= \square - \square$$

$$= \square$$

Write expression for total cost.

Rewrite 3.99 as $\square - \square$.

Distributive property

Multiply using mental math.

Subtract using mental math.

Answer: The total cost of the beads is \$ \square .

✓ **Checkpoint** Use the distributive property to evaluate the expression.

1. $2(9 + 4)$	2. $(12 - 3)3$	3. $(4 - 11)(-4)$

Evaluate the expression using the distributive property and mental math.

4. $5(103)$	5. $4(3.8)$	6. $3(6.03)$

Example 2 Writing Equivalent Variable Expressions

Use the distributive property to write an equivalent variable expression.

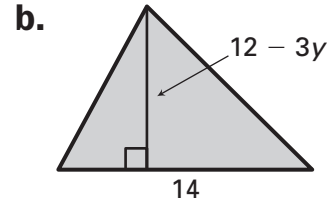
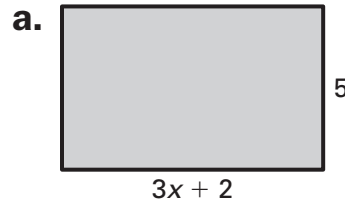
- a. $2(x + 10) =$ Distributive property
= Multiply.
- b. $(m + 3)(-4) =$ Distributive property
= Multiply.
= Definition of subtraction
- c. $-3(2y - 6) =$ Distributive property
= Multiply.
= Definition of subtraction

✓ **Checkpoint** Use the distributive property to write an equivalent variable expression.

7. $(x + 7)4$	8. $-3(4m - 7)$
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Example 3 *Finding Areas of Geometric Figures*

Find the area of the rectangle or triangle.



Solution

a. Use the formula for the area of a rectangle.

$$\begin{aligned}
 A &= \ell w \\
 &= (\text{ }) (\text{ }) \\
 &= \text{ } (\text{ }) + \text{ } (\text{ }) \\
 &= \text{ }
 \end{aligned}$$

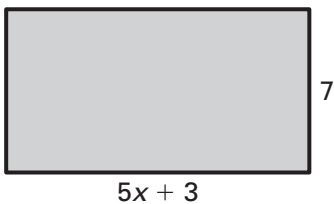
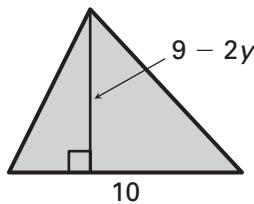
Answer: The area is square units.

b. Use the formula for the area of a triangle.

$$\begin{aligned}
 A &= \frac{1}{2}bh = \frac{1}{2}(\text{ })(\text{ }) \\
 &= \text{ } (\text{ }) \\
 &= \text{ } (\text{ }) - \text{ } (\text{ }) \\
 &= \text{ }
 \end{aligned}$$

Answer: The area is square units.

✓ **Checkpoint** Find the area of the rectangle or triangle.

9. 	10. 
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