

# Distributive Property

I can use the distributive property with numerical and variable expressions.

According to the **Distributive Property**, you **distribute** or "pass out" a multiplication to each part of a sum or difference in parentheses.  
 In  $2(a + 3) = 2a + 6$ , we "pass out" the 2 by multiplying it by both the  $a$  and the 3.

Multiply  $6(x - 9)$

$$6(x) - 6(9)$$

$$\boxed{6x - 54}$$

Multiply  $-3(h + 2)$

$$-3(h) + -3(2)$$

$$\boxed{-3h + -6}$$

Look at the examples, and then try the other problems.

## Arithmetic

Order of Operations

$$3(2 + 6)$$

$$3(8)$$

$$\boxed{24}$$

Distributive property

$$3(2 + 6)$$

$$3(2) + 3(6)$$

$$6 + 18$$

$$\boxed{24}$$

*Same*

## Algebraic

$$4(b + 3)$$

$$4(b) + 4(3)$$

$$\boxed{4b + 12}$$

*You don't have to show*

Order of Operations

$$7(6 - 4)$$

$$7(2)$$

$$\boxed{14}$$

Distributive property

$$7(6 - 4)$$

$$7(6) - 7(4)$$

$$42 - 28$$

$$\boxed{14}$$

$$-2(x + 4)$$

$$-2(x) + -2(4)$$

$$\boxed{-2x + -8}$$

With numerical expressions, whether you solve using the distributive property or using the correct order of operations, you get the same solution.

Order of Operations

$$5(4 + 1)$$

$$5(5)$$

$$25$$

Distributive property

$$5(4 + 1)$$

$$20 + 5$$

$$25$$

Order of Operations

$$-2(3 + 4)$$

$$-2(7)$$

$$-14$$

Distributive property

$$-2(3 + 4)$$

$$-6 + -8$$

$$-14$$

Sometimes, we need to use the distributive property to simplify variable expressions. We will simplify these together.

$$5(t + 1)$$

$$5t + 5$$

$$-2(y + 4)$$

$$-2y + -8$$

$$3(-2r + 7)$$

$$-6r + 21$$

$$-6(2 + 7g)$$

$$-12 + 42g$$

$$(3v + 4)9$$

$$27v + 36$$

## Practice

Use the distributive property to simplify.

1.  $4(j + 10)$   $4j + 40$

2.  $7(4n - 6)$   $28n - 42$

3.  $-2(-g + 4)$   $2g + 8$

4.  $(4c + 2)3$   $12c + 6$

5.  $6(-2p + 7)$   $-12p + 42$

6.  $5(2r - 4)$   $10r - 20$

## Homework

Simplify using order of operations and then solve using the distributive property.

1. Order of Operations:  $3(-4 - 8)$   
 Distributive property:  $3(-4 - 8)$

2. Order of Operations:  $-6(-5 + 8)$   
 Distributive property:  $-6(-5 + 8)$

Use the distributive property to simplify.

3.  $3(x + 4)$  \_\_\_\_\_

5.  $-2(y + 8)$  \_\_\_\_\_

7.  $8(-x + 7)$  \_\_\_\_\_

9.  $(x + 4)2$  \_\_\_\_\_

11.  $-3(1 - 2k)$  \_\_\_\_\_

13.  $10(3a - 6)$  \_\_\_\_\_

$\frac{1}{2} \cdot 10 = 5$

$\frac{1}{2} \cdot 16 = 8$

4.  $-7(t - 3)$  \_\_\_\_\_

6.  $-4(-y + 3)$  \_\_\_\_\_

8.  $11(4x + 3)$  \_\_\_\_\_

10.  $3(-2b - 8)$  \_\_\_\_\_

12.  $(-2s + 9)6$  \_\_\_\_\_

14.  $\frac{1}{2}(-6x + 14)$  \_\_\_\_\_

## Review

Combine like terms to simplify.

13.  $5a + a$  \_\_\_\_\_

15.  $18 + 7x - 12 - 7x$  \_\_\_\_\_

\_\_\_\_\_

14.  $6x + 3y + 6y - 2x$  \_\_\_\_\_

16.  $10r + 100s + 50t$  \_\_\_\_\_

18.  $12 + 2 + 3x - 12 - 5y + 7z - 10x$  \_\_\_\_\_

continued on the next page.

