

# 0.1 Distributive Property

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## Distributive Property

Chapter 0 — Absolute Foundations

*Directions: Show all work. Distribute to **every** term inside parentheses.*

Name: \_\_\_\_\_ Date: \_\_\_\_\_

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### Key Idea — Distributive Property

**Distribute (multiply) to every term inside the parentheses.**

**Form:**  $a(b + c) = ab + ac$  and  $a(b - c) = ab - ac$ .

**Helpful memory:** Whatever is outside the parentheses gets multiplied by each term inside.

### Common Mistakes to Avoid

- **Forgetting a term:**  $3(x + 5)$  must become  $3x + 15$  (not just  $3x + 5$ ).
- **Sign mistakes:**  $-2(x - 4) = -2x + 8$ .
- **Parentheses matter:**  $-(x - 7) = -x + 7$ .
- **Combining unlike terms too early:** Distribute first, then simplify.

## Worked Examples (Follow the Steps)

**Example 1.** Expand:  $4(x + 3)$

$$4(x + 3) = 4 \cdot x + 4 \cdot 3 = 4x + 12.$$

**Example 2.** Expand:  $-3(2x - 5)$

$$-3(2x - 5) = (-3) \cdot 2x + (-3) \cdot (-5) = -6x + 15.$$

**Example 3.** Expand and simplify:  $2(x + 4) + 3(x - 1)$

$$2(x + 4) + 3(x - 1) = (2x + 8) + (3x - 3) = 5x + 5.$$

**Example 4.** Factor using the distributive property (reverse direction):  $6x + 18$

$$6x + 18 = 6(x + 3).$$

**Your turn (mini-check).** Expand:  $-(x + 9) \Rightarrow \underline{\hspace{2cm}}$

### Practice A — Distribute (Warm-Up)

Expand. (Distribute to *every* term.)

1.  $3(x + 7)$

2.  $5(x - 2)$

3.  $-4(x + 6)$

4.  $2(3x + 1)$

5.  $-7(2x - 5)$

6.  $\frac{1}{2}(8x - 10)$

### Practice B — Distribute with Negatives and Parentheses

Expand and simplify.

1.  $-(x - 8)$

$$2. -(2x + 3)$$

$$3. -2(x - 9)$$

$$4. -3(4x + 2)$$

$$5. 2 - (x - 5)$$

$$6. 7 - (2x + 1)$$

### Practice C — Combine Like Terms After Distributing

Expand, then simplify completely.

$$1. 2(x + 5) + x$$

$$2. 3(x - 4) + 2x$$

$$3. 4(x + 1) - 2(x - 3)$$

$$4. -3(x - 2) + 5(x + 1)$$

$$5. 2(2x - 1) + 3(x + 4)$$

$$6. 5(x - 3) - 2(3x - 7)$$

## Practice D — Factor (Distribute Backwards)

Factor out the greatest common factor (GCF).

1.  $8x + 24$

2.  $15x - 10$

3.  $12x + 18$

4.  $9x - 27$

5.  $14x + 21$

6.  $6x - 42$

## Practice E — Spot the Distributive Property

For each, circle the part where the distributive property is used, then write the simplified result.

1.  $3(x + 2) + 3(x - 5)$

2.  $10(0.3x + 0.7)$

3.  $2(5 + x)$

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

## Challenge (Optional)

These are a bit harder — try your best.

1. Find  $x$  if  $3(x - 2) = 2x + 7$ .

2. Simplify:  $2(3x - (x - 4))$ .