

Property	Key Idea	Word Description	Number Description
Commutative Property	changing the order of numbers when adding/multiplying	changing the order of addends or factors does not change the sum or product	$3 + x + 4 = 3 + 4 + x$ $(4 \cdot 5) + 6 = (5 \cdot 4) + 6$ $(8 + 3) + 10 = 10 + (8 + 3)$
Associative Property	regrouping numbers without changing the order	regrouping addends or factors does not change the sum or product	$(9 \cdot 8) \cdot 2 = 9 \cdot (8 \cdot 2)$ $(x + 2) + 9 = x + (2 + 9)$
Distributive Property	rewriting an expression using multiplication	multiply each number inside the parentheses by the number outside the parentheses then add/subtract	$8(x + 5) = 8x + 8 \cdot 5$ $2(3 + 4) = 2 \cdot 3 + 2 \cdot 4$
Identity Property	keeping the number the same	multiplying by 1 and adding zero does not change the value of the number	$4 + 0 = 4$ $(4x + 2) + 0 = 4x + 2$  $x \cdot 1 = x$ $(6x + 3) \cdot 1 = 6x + 3$
Inverse Property	undo or canceling a number	the sum of opposites is 0  the product of reciprocals is 1	$7 + -7 = 0$ $x + -x = 0$  $4 \cdot 1/4 = 1$ $2/3 \cdot 3/2 = 1$
Zero Property	multiplying by zero	the product of a number and zero is zero	$3 \cdot 0 = 0$ $m \cdot 0 = 0$ $(8x + 1) \cdot 0 = 0$

**Practice: Identify the following properties.**

- $2 + (9 + 7) = (2 + 9) + 7$  \_\_\_\_\_
- $0 + 6 = 6$  \_\_\_\_\_
- $10 \cdot 8 = 8 \cdot 10$  \_\_\_\_\_
- $0 \cdot 12 = 0$  \_\_\_\_\_
- $7(2 + 4) = 7(2) + 7(4)$  \_\_\_\_\_
- $5 + -5 = 0$  \_\_\_\_\_
- $4 + (-2 + 3) = 4 + (3 + -2)$  \_\_\_\_\_
- $7 \cdot \frac{1}{7} = 1$  \_\_\_\_\_

**Practice: Circle the best answer.**

**1**  $(6 \cdot 2) \cdot 8 = (6 \cdot 8) \cdot 2$

- A Associative Property
- B Commutative Property
- C Distributive Property
- D Inverse Property

**2 Which sentence illustrates the Distributive Property?**

- A  $5(10+16) = 5 \cdot 26$
- B  $5(10+16) = 5(16+10)$
- C  $5(10+16) = 5 \cdot 10 + 5 \cdot 16$
- D  $5(10+16) = 5+10 \cdot 5+16$

**3  $7+0=7$  is an example of which property?**

- A Zero Property
- B Identity Property
- C Commutative Property
- D Inverse Property

**4 Multiplicative Inverse Property states that \_\_\_\_\_.**

- A the product of a number and 1 is equal to the given number.
- B the product of a number and its reciprocal is equal to 1.
- C the product of a number and 0 is equal to 0.
- D regrouping the factors does not change the product.

**5  $(2+4) +5 = (4+2) +5$  is an example of which property?**

- A Zero Property
- B Identity Property
- C Commutative Property
- D Inverse Property

**6 Jordan's teacher asked him to add  $7+43+5$ . To make her addition easier, Sarah rewrote the problem as  $5+7+43$ . Which property allows him to make this change?**

- A Associative Property
- B Commutative Property
- C Distributive Property
- D Inverse Property

**7 Which sentence illustrates the Inverse Property of Multiplication?**

- A  $7 + -7 = 0$
- B  $4 \cdot \frac{1}{4} = 1$
- C  $-12 + 0 = -12$
- D  $(7 \cdot -7) = (-7 \cdot 7)$

**8  $(12 \cdot 4) \cdot 7 = (4 \cdot 12) \cdot 7$  is an example of which property?**

- A Distributive Property
- B Associative Property
- C Commutative Property
- D Inverse Property

**9  $0 \cdot [\frac{3}{4} + 2.59] = 0$**

- A Zero Property
- B Identity Property
- C Commutative Property
- D Inverse Property

**10  $13 + -13 = 0$  is an example of which property?**

- A Associative Property
- B Commutative Property
- C Distributive Property
- D Inverse Property

## Distributing and Combining Like Terms

Simplify the following expressions. Circle your final answer when finished simplifying.

11. $-8h - 4h + 7 - 3$	12. $10 - 36x - (-12x) + 4$
13. $-6(9w + 2)$	14. $-2(-6m + 4) + m$
15. $-5(2x - 4) + 4(x - 3)$	16. $\frac{1}{5}(10x - 15) + 6 - 3x$
17. $-4(2x + 5) - 2(\frac{1}{2}x + 5)$	18. $\frac{4}{5}(-10x - 5) + 16 - 12x + 5$
Find the product using the distributive property and mental math	
19. $5(197) = 5(100 + 90 + 7)$	20. $5(197) = 5(200 - \underline{\quad})$
21. $7(32)$	22. $6(399)$

23. Find the cost of 9 CDs priced at \$17.20 each.

24.

Select the expression that represents the total area of the rectangles below.



a  $2x + 10$

b  $2x + 8$

c  $2x + 16$

d  $x + 16$

25.  $\frac{266}{4} = \frac{\quad}{4} + \frac{\quad}{4} + \frac{\quad}{4}$

26.  $\frac{837}{2} =$

27.  $\frac{18x - 12}{6} =$

28.  $\frac{-4x - 20}{-6} =$