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Properties of Addition and Multiplication

In math, there are certain principles or rules that will always be true. These rules are called **properties**. Knowing and following math properties will help you to solve math problems. There are several math properties.

ADDITION PROPERTIES	MULTIPLICATION PROPERTIES
Commutative Property Changing the order of addends does not change the sum. $a + b = b + a$ *Example: 3 + 7 = 7 + 3* *10 = 10*	**Commutative Property** Changing the order of factors does not change the product. $a \times b = b \times a$ *Example: 3 x 7 = 7 x 3* *21 = 21*
Associative Property Changing the grouping of the addends does not change the sum. $(a + b) + c = a + (b + c)$ *Example: (5 + 6) + 4 = 5 + (6 + 4)* *11 + 4 = 5 + 10* *15 = 15*	**Associative Property** Changing the grouping of the factors does not change the product. $(a \times b) \times c = a \times (b \times c)$ *Example: (8 x 2) x 3 = 8 x (2 x 3)* *16 x 3 = 8 x 6* *48 = 48*
Identity Property The sum of any number and zero is that number. $a + 0 = a$ *Example: 7 + 0 = 7*	**Identity Property** The product of one and any number is that number. $a \times 1 = a$ *Example: 5 x 1 = 5*
Zero is called the additive identity. *One is called the multiplicative identity.*	**Zero Property** The product of zero and any number is zero. $a \times 0 = 0$ *Example: 4 x 0 = 0*
Distributive Property The product of a factor and a sum is equal to the sum of the products. $a \times (b + c) = (a \times b) + (a \times c)$ *Example: 3 x (5 + 8) = (3 x 5) + (3 x 8)* *3 x 13 = 15 + 24* *39 = 39*	

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Match the Properties

Write the letter of the matching property in the blank next to the equation.
Letters may be used more than once.

___ **1.** $5 \times 0 = 0$

___ **2.** $(6 \times 4) + (6 \times 11) = 6 \times (4 + 11)$

___ **3.** $4 + 9 = 9 + 4$

___ **4.** $(6 + 2) + 8 = 6 + (2 + 8)$

___ **5.** $27 + 0 = 27$

___ **6.** $36 \times 1 = 36$

___ **7.** $(9 \times 8) \times 15 = 9 \times (8 \times 15)$

___ **8.** $17 \times 33 = 33 \times 17$

___ **9.** $(2 \times 7) \times 4 = 2 \times (7 \times 4)$

___ **10.** $(5 + 3) + 9 = 5 + (3 + 9)$

___ **11.** $2 \times (3 + 7) = (2 \times 3) + (2 \times 7)$

___ **12.** $4 + (6 + 3) = 4 + (3 + 6)$

___ **13.** $48 \times 0 = 0$

___ **14.** $51 \times 30 = 30 \times 51$

___ **15.** $42 \times 1 = 42$

___ ___ **16.** $2 + (8 + 6) = (2 + 6) + 8$

a. Commutative Property of Addition

b. Commutative Property of Multiplication

c. Associative Property of Addition

d. Associative Property of Multiplication

e. Identity Property of Addition

f. Identity Property of Multiplication

g. Zero Property of Multiplication

h. Distributive Property

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Find the Missing Numbers

Use what you have learned about properties to find the missing number in
each equation.

1. (3 + 4) + 7 = 3 + (4 + __)

2. 15 + __ = 15

3. (4 x 12) x 6 = __ x (12 x 6)

4. (2 x 7) x 5 = 2 x (__ x 5)

5. 35 x __ = 14 x 35

6. 24 x 1 = __

7. (15 + __) + 29 = 15 + (8 + 29)

8. 9 x (4 + 12) = (9 x 4) + (9 x __)

9. 8 + (26 + 30) = 8 + (__ + 26)

10. 22 x 0 = __

11. 25 x 6 = __ x 25

12. __ x 1 = 37

13. __ + (28 + 4) = (42 + 4) + 28

14. 5 x __ = 0

15. (5 x 25)+ (__ x 6) = 5 x (25 + 6)

16. 6 + __ = 9 + 6