

Properties of Operations in Algebra

Commutative Property of Addition $a + b = b + a$	$2 + 3 = 3 + 2$	Change the order, get the same answer
Commutative Property of Multiplication $a \cdot b = b \cdot a$	$2 \cdot (3) = 3 \cdot (2)$	Change the order, get the same answer
Associative Property of Addition $a + (b + c) = (a + b) + c$	$2 + (3 + 4) = (2 + 3) + 4$	Regroup, don't change the order
Associative Property of Multiplication $a \cdot (b \cdot c) = (a \cdot b) \cdot c$	$2 \cdot (3 \cdot 4) = (2 \cdot 3) \cdot 4$	Regroup, don't change the order
Distributive Property $a \cdot (b + c) = a \cdot b + a \cdot c$	$2 \cdot (\underline{3} + \underline{4}) = 2 \cdot \underline{3} + 2 \cdot \underline{4}$	Distribute, or share, the 2 across the parentheses

Additive Identity Property $a + 0 = a$	$3 + 0 = 3$	Add 0, and the number stays the same, keeps its <i>identity</i>
Multiplicative Identity Property $a \cdot 1 = a$	$3 \cdot 1 = 3$	Multiply by 1, and the number stays the same, keeps its <i>identity</i>
Additive Inverse Property $a + (-a) = 0$	$3 + (-3) = 0$	The sum of a number and its opposite is equal to 0
Multiplicative Inverse Property $a \cdot \left(\frac{1}{a}\right) = 1$	$3 \cdot \left(\frac{1}{3}\right) = 1$	When you multiply an number by its reciprocal, the answer is 1
Zero Property $a \cdot 0 = 0$	$5 \cdot 0 = 0$	Any number multiplied by 0 equals 0

Problems for Properties:

1. $8 + 4 = 4 + 8$

2. $17 + 0 = 17$

3. $-6 + 6 = 0$

4. $9(x + 2) = 9*x + 9*2$

5. $9 * 13 = 13 * 9$

6. $9 + (11 + 7) = (9 + 11) + 7$

7. $ab = ba$

8. $21 * 1 = 21$

9. $x + 0 = x$

10. $8(3) = 3(8)$

11. $9b + a = a + 9b$

12. $3 + (5 + 10) = (10 + 5) + 3$

13. $9 * 0 = 0$

14. $-18 + 18 = 0$

15. $4x + 0 = 4x$

16. $5b + - 5b = 0$