

Properties of Operations and Identities	Property	Example(s)
Commutative Property of Addition	$a + b = b + a$	$7 + 12 = 12 + 7$ $14 + x = x + 14$
Commutative Property of Multiplication	$ab = ba$	$4(5) = 5(4)$ $x(4) = 4x$
Associative Property of Addition	$(a + b) + c = a + (b + c)$	$(8 + 3) + 4 = 8 + (3 + 4)$
Associative Property of Multiplication	$(ab)c = a(bc)$	$(4(3))(5) = 4(3(5))$ $(6(2))y = 6(2y)$
Distributive Property of Multiplication over Addition	$a(b + c) = ab + ac$ $(b + c)a = ba + ca$	$3(4 + 2) = 3(4) + 3(2)$ $8(y + 3) = 8y + 8(3)$
Additive Identity Property	$a + 0 = 0 + a = a$	$4 + 0 = 0 + 4 = 4$ $a + 0 = 0 + a = a$
Multiplicative Identity Property	$1(a) = a(1) = a$	$3(13) = 13(1) = 13$ $x(y) = y(1) = y$
Quotient Property	$a(\frac{1}{a}) = \frac{a}{a}$	$5(\frac{1}{5}) = \frac{5}{5}$
Multiplicative Inverse Property	For every a , there exists a number $\frac{1}{a}$ such that $a(\frac{1}{a}) = 1$	$2(\frac{1}{2}) = 1$ $7(\frac{1}{7}) = 1$
Multiplication Property of Zero	$0(a) = a(0) = 0$	$0(9) = 9(0) = 0$ $0y = y(0) = 0$