2.2-2.4 Properties

Goals: *Understand, identify and apply properties of addition and multiplication

Properties of Addition

Commutative Property: You can add it any order

Algebra: $a + b = b + a$

Ex: $3 + 2 = 2 + 3$
$5 = 5$

Associative Property: When adding, it does not matter which order you group.

Algebra: $(a + b) + c = a + (b + c)$

Ex: $(2 + 3) + 4 = 2 + (3 + 4)$
$5 + 4 = 2 + 7$
$9 = 9$

Identity Property: If you add 0 to any number, you get the original number

Algebra: $a + 0 = a$

Ex: $3 + 0 = 3$

Inverse Property: If you add any number and its opposite you get 0

Algebra: $a + (-a) = 0$

Ex: $3 + (-3) = 0$

Identify the property being illustrated.

Ex: $(7) + (-7) = 0$

Inverse Property

Ex: $-12 + 0 = -12$

Additive Identity

Ex: $4 + 8 = 8 + 4$

Commutative

Properties of Multiplication

Commutative Property: You can multiply in any order

Algebra: $a \cdot b = b \cdot a$

Ex: $3 \cdot 2 = 2 \cdot 3$
$6 = 6$

Associative Property: When multiplying it does not matter what order you group

Algebra: $(a \cdot b) \cdot c = a \cdot (b \cdot c)$

Ex: $(2 \cdot 3) \cdot 4 = 2 \cdot (3 \cdot 4)$
$6 \cdot 4 = 2 \cdot 12$
$24 = 24$

Identity Property: Any number times 1 is itself

Algebra: $a \cdot 1 = a$

Ex: $3 \cdot 1 = 3$

Property of Zero: Any number times 0 is 0

Algebra: $a \cdot 0 = 0$

Ex: $3 \cdot 0 = 0$

Property of –1: Any number times –1 is its opposite

Algebra: $a \cdot (-1) = -a$

Ex: $3 \cdot (-1) = -3$

Identify the property being illustrated.

Ex: $-1 \cdot 8 = -8$
Property of –1

Ex: $12 \cdot x = x \cdot 12$
Commutative

Ex: $(y \cdot 9) \cdot 4 = y \cdot (9 \cdot 4)$
Associative

Ex: $0 \cdot 41 = 0$
Property of zero

Ex: $-5(-6) = (-6)(-5)$
Commutative

Ex: $-13(-1) = 13$
Property of –1