

1.6 Properties

9-21-17

p. 28

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Commutative Property

Associative Property

Identity Property

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Commutative Property		
Words	Numbers	Algebra
You can <u>add</u> numbers in any <u>order</u> and <u>multiply</u> numbers in any <u>order</u> .	$3 + 8 = 8 + 3$ $5 \cdot 7 = 7 \cdot 5$	$a + b = b + a$ $ab = ba$

Commutative
Property

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Associative Property		
Words	Numbers	Algebra
When you <u>add</u> or <u>multiply</u> , you can <u>group</u> the numbers together in any combination.	$(4 + 5) + 1 = 4 + (5 + 1)$ $(9 \cdot 2) \cdot 6 = 9 \cdot (2 \cdot 6)$	$(a + b) + c = a + (b + c)$ $(a \cdot b) \cdot c = a \cdot (b \cdot c)$

Associative
Property

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Identity Property		
Words	Numbers	Algebra
The sum of 0 and any number is the number. The product of 1 and any number is the number.	$4 + 0 = 4$ $8 \cdot 1 = 8$	$a + 0 = a$ $a \cdot 1 = a$

Identity
Property

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Tell which property is represented.

A. $(2 \cdot 6) \cdot 1 = 2 \cdot (6 \cdot 1)$
Associative Prop.

B. $3 + 0 = 3$
Identity Property

C. $7 + 9 = 9 + 7$
Commutative Prop.

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Tell which property is represented.

A. $7 \cdot 1 = 7$

Identity Prop.

B. $3 + 4 = 4 + 3$

Commutative Prop.

C. $(5 \cdot 1) \cdot 2 = 5 \cdot (1 \cdot 2)$

Associative Prop.

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Simplify each expression. Justify each step.

A. $21 + 16 + 9$

$$\begin{aligned}
 21 + 16 + 9 &= 16 + 9 + 21 && \text{Commutative Property.} \\
 &= \cancel{16} + (\cancel{9} + 21) && \text{Associative Property.} \\
 &= 16 + 30 && \text{Add.} \\
 &= 46
 \end{aligned}$$

$$\begin{aligned}
 &21 + 9 + 16 \text{ Comm.} \\
 &30 + 16 = 46
 \end{aligned}$$

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B. $20 \cdot 9 \cdot 5$

$$20 \cdot 5 \cdot 9 \text{ Comm.}$$

$$100 \cdot 9 = 900$$

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Simplify each expression. Justify each step.**A. $17 + 14 + 3$**

$$17 + 3 + 14 \text{ Comm.}$$

$$20 + 14 = 34$$

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B. $12 \cdot 3 \cdot 5$

$$12 \cdot 5 \cdot 3 \text{ Comm.}$$

$$60 \cdot 3 = 180$$

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Tell which property is represented.

1. $17 \cdot 1 = 17$ Identity Prop.

2. $(12 + 14) + 5 = 12 + (14 + 5)$ Associative

3. $2 \cdot 16 = 16 \cdot 2$

Commutative Prop.

Simplify each expression. Justify each step.

4. $4 \cdot 12 \cdot 25$ $25 \cdot 4 \cdot 12$ Comm.

5. $48 + (15 + 2)$ $100 \cdot 12 = 1200$

$$48 + 2 + 15 \text{ Comm.}$$

$$50 + 15 = 65$$

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