

Name: _____ grade 6 Mr. Hoffman

Class notes Organizer Commutative and Associative Properties

MATH PROPERTIES

Properties are the rules of math to help solve a math problem easier. Subjects such as Geometry and Algebra follow these properties. It is essential for every mathematician to not only memorize, but *apply* these properties as well.

The Commutative Property of Addition and Multiplication: The order of the numbers does not change the sum when I add, or the product when I multiply. Not solving just a rule.

$$2 + 7 = 7 + 2$$

$$\frac{1}{2} + \frac{1}{4} = \frac{1}{4} + \frac{1}{2}$$

$$1 + 2 + 3 = 3 + 2 + 1$$

$$0.7 + 12.5 = 12.5 + 0.7$$

$a + b = b + a$ where a and b could be any numbers

$$9 \times 5 = 5 \times 9$$

$$10 \cdot 17 = 17 \cdot 10$$

$a \times b = b \times a$ where a and b could be any numbers

create one example of the commutative property: _____

Which operations are *not* commutative? _____

"Remember helper" Commutative property... think "Commute" **back and forth** to work

This math property is very helpful when adding a string of numbers; it's easier to compute pairs of numbers mentally:

ex: $312 + 25 + 75$ better _____ = _____

ex: $23 \times 5 \times 2$ better _____ = _____

Q1) Which one of the following shows the commutative property of multiplication? *multiple choice*

- A) $2 \times 7 = 7 + 2$ B) $2 + 7 = 7 + 2$ C) $a \times b = b \times c$ D) $7 \times a = a \times 7$

Q2) Circle the one that is NOT showing the commutative property!

- $2 + 1 + 7 = 7 + 1 + 2$ $15 \times 3 = 3 \times 15$ $\frac{1}{4} + 0.83 = 0.83 + 0.25$ $k \cdot l \cdot m = n \cdot l \cdot k$

Q3) True or false? $9 \div 3 = 3 \div 9$ _____ $8 - 2 = 2 - 8$ _____

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**Associative Property of Addition and Multiplication: Changing the grouping when adding or multiplying does not change the answer. Notice the order of the numbers is the same.**

$$98 + (2 + 23) = (98 + 2) + 23$$

$$8 \times (5 \times 7) = (8 \times 5) \times 7$$

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

$$(r \times s) \times t = r \times (s \times t)$$

create one example of the associative property: \_\_\_\_\_

"Remember helper" Associative property...think "Associates" are your **groups** of friends.

**Finish the right side showing the Associative Property:**

$$5 \times (20 \times 9) = \underline{\hspace{2cm}}$$

**How could this help you? Hint: Look for numbers that could get grouped together and "I like pretty rainbows."**

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14 + 15 + 16 + 17 + 18 + 19 + 20$$

ANSWER: \_\_\_\_\_

Name: \_\_\_\_\_ Mr. Hoffman math 6 Sept.

Commutative & Associative Properties of Addition and Multiplication (homework)

Based on what you learned in class today...

1) Write the name of the property being displayed (Commutative of Addition, Commutative of multiplication):

$28 + 12 = 12 + 28$  \_\_\_\_\_

$17 \times 100 = 100 \times 17$  \_\_\_\_\_

$e + f = f + e$  \_\_\_\_\_

$a \times b = b \times a$  \_\_\_\_\_

$2 \times 3 \times 5 = 5 \times 2 \times 3$  \_\_\_\_\_

2) In your own words, finish these statements...

The **commutative property** of addition and multiplication states that \_\_\_\_\_

3) What is the “remember helper” that we learned in class for remembering the commutative property?

4) Find the value of each unknown variable (letter):

$r \times 100 = 100 \times 60$        $r =$  \_\_\_\_\_

$1.1 + 5.7 = 5.7 + k$        $k =$  \_\_\_\_\_

5) Create your own example for each using either whole numbers, decimals, or fractions.

commutative property of addition \_\_\_\_\_

commutative property of multiplication \_\_\_\_\_

6) Explain why the commutative property does not work for subtraction.

Back up your reasoning with proof using numbers. \_\_\_\_\_

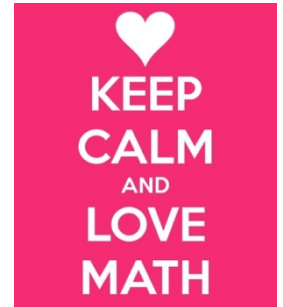
7) Use the commutative property of addition to help you arrive at the sum (answer) using mental math only.

$210 + 47.3 + 90 =$  \_\_\_\_\_



8) What is the “remember helper” that we learned in class for remembering the **associative property**?

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9) Find the missing value for each variable (this is the associative property in action):

$$\begin{array}{ll} 2 + (4 + n) = (2 + 4) + 5 & n = \underline{\hspace{2cm}} \\ 4 \times (2.1 \times 6) = (a \times 2.1) \times 6 & a = \underline{\hspace{2cm}} \\ j \times 2 \frac{3}{4} = 2 \frac{3}{4} \times 6 \frac{1}{4} & j = \underline{\hspace{2cm}} \\ (4.873 + h) + 27.1 = 4.873 + (-9 + 27.1) & h = \underline{\hspace{2cm}} \end{array}$$

10) Use your knowledge of the two learned properties to solve each **mentally**

$$\begin{array}{ll} 98 + 25 + 2 & \underline{\hspace{2cm}} & 72 + (28 + 135) + 0 & \underline{\hspace{2cm}} \\ 17 + 18 + 3 + 2 & \underline{\hspace{2cm}} & (26 + 91) + 9 & \underline{\hspace{2cm}} \end{array}$$

11) Tell which property is being displayed (**just write the numbers 1, 2, 3 or 4**) on the line.

- |                                           |                                           |
|-------------------------------------------|-------------------------------------------|
| 1) Commutative property of addition       | 3) Associative property of addition       |
| 2) Commutative property of multiplication | 4) Associative property of multiplication |

$$\begin{array}{ll} 39 + 3 = 3 + 39 & \underline{\hspace{2cm}} & (3 + 30) + 9 = 3 + (30 + 9) & \underline{\hspace{2cm}} \\ (19 \times 2) \times 18 = 19 \times (2 \times 18) & \underline{\hspace{2cm}} & 4 \times 24 = 24 \times 4 & \underline{\hspace{2cm}} \end{array}$$

12) Does the commutative property work with division assuming you are not using the same numbers to divide?

circle YES or NO

Then in the box, strongly prove your answer below using numbers!