Properties of Numbers

- The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:

Expressions, equations, & relationships.

6.7D

- generate equivalent expressions using the properties of operations: **inverse**, **identity**, **commutative**, **associative**, and **distributive properties**

- determine if two expressions are equivalent using **concrete models**, **pictorial models**, & **algebraic representations**

6.7C

My teacher's learning goals for me are that I will be able to:

- generate **equivalent expressions**
  - using the
    - **inverse** number property.
    - **identity** number property.
    - **commutative** number property.
    - **associative** number property.
- determine if expressions are equivalent and justify my reasoning using the number properties.

I will master the **learning goals** for Properties of Numbers **with at least** _____ **mastery** by:

1) **Asking** questions when I'm not sure of something and **answering** questions when I know the answer.
2) _____
3) _____

Equivalent Expressions Using Properties

Commutative Properties — The order in which two numbers are added or multiplied does not change their sum or product.

$7 + 9 = 9 + 7$ $\quad 4 \cdot 6 = 6 \cdot 4$

$a + b = b + a$ $\quad a \cdot b = b \cdot a$

Associative Properties — The way in which three numbers are grouped when they are added or multiplied does not change their sum or product.

$3 + (9 + 4) = (3 + 9) + 4$ $\quad 8 \cdot (5 \cdot 7) = (8 \cdot 5) \cdot 7$

$a + (b + c) = (a + b) + c$ $\quad a \cdot (b \cdot c) = (a \cdot b) \cdot c$

Identity Properties — The sum of an addend and 0 is the addend. The product of a factor and 1 is the factor.

$13 + 0 = 13$ $\quad 7 \cdot 1 = 7$

$a + 0 = a$ $\quad a \cdot 1 = a$

Inverse Properties — The sum of an addend and its additive inverse is 0. The product of a factor and its multiplicative inverse is 1.

$6 + (-6) = 0$ $\quad 6 \cdot \frac{1}{6} = 1$

$a + (-a) = 0$ $\quad a \cdot \frac{1}{a} = 1$

The two operations we use with the Properties of Numbers are _____ and _____.

TERM: Commutative Properties My level of understanding: 1 2 3 4

My DESCRIPTION of this term:

My PICTURE to help me remember this term:

http://education-portal.com/academy/lesson/the-commutative-property-definition-and-examples.html

TERM: Associative Properties My level of understanding: 1 2 3 4

My DESCRIPTION of this term:

My PICTURE to help me remember this term:

TERM: Identity Properties My level of understanding: 1 2 3 4

My DESCRIPTION of this term:

My PICTURE to help me remember this term:

TERM: Inverse Properties My level of understanding: 1 2 3 4

My DESCRIPTION of this term:

My PICTURE to help me remember this term:

Properties of Numbers I do...and you follow along and process

Part I: Identity and Inverse Properties

Use either + or × symbol to complete the equation. Then identify the property used as either identity or inverse.

A. $2 \square 0 = 2$

Property:

B. $5 \square \frac{1}{5} = 1$

Property:

C. $2 \square (-2) = 0$

Property:

C. $\frac{1}{10} \square 10 = 1$

Property:

D. $0 \square 8 = 8$

Property:

E. $1 \square 12 = 12$

Property:

Part II: Commutative and Associative Properties

The equations in each problem are equivalent. Fill in the missing number and write the property used.

F.

$5 + \_\_\_\_ = 11$

$6 + 5 = \_\_\_\_$

Property:

G.

$4 \times (7 \times 2) = \_\_\_$

$(4 \times 7) \times \_\_\_ = 56$

Property:

H.

$11 + 7 = \_\_\_\_$

$7 + \_\_\_\_ = 18$

Property:

I.

$(\_\_\_ + 8) + 3 = 15$

$4 + (8 + 3) = \_\_\_$

Property:

J.

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

$\_\_\_ \times 2 = 10$

Property:

K.

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

$7 \times (5 \times \_\_\_) = 280$

Property:

Part III: Identify the Property

Name which property is modeled in the equation: identity, inverse, associative or commutative.

L. $4 + 9 = 9 + 4$

Property:

M. $2 \times \frac{1}{2} = 1$

Property:

N. $11 \times (7 \times 5) = (11 \times 7) \times 5$

Property:

O. $2 + 0 = 2$

Property:

P. $6 \times 4 = 4 \times 6$

Property:

Q. $(9 + 2) + 6 = 9 + (2 + 6)$

Property:

R. $5 \times 1 = 5$

Property:

S. $-3 + 3 = 0$

Property: