Properties

Holt Book 1-6 Title Page

Property of Zero – Tab 1

The product of a factor and zero is zero.

$$2 \cdot 0 = 0$$

For any number a,

$$a \cdot 0 = 0$$

Identity Properties of Addition and Multiplication = the itself property- #2

Addition

The sum of an addend and zero is the addend.

$5 + 0 = 5$

For any number *a*,

$a + 0 = a$

Multiplication

The product of a factor and one is the factor.

$7 \cdot 1 = 7$

For any number a,

$a \cdot 1 = a$

Commutative Properties of Addition and Multiplication – Tab 3

Addition

The order in which numbers are added does not change the sum.

$$4 + 7 = 7 + 4$$

For any number *a* and *b*,

$$a + b = b + a$$

Multiplication

The order in which numbers are multiplied does not change the product.

$$6 \cdot 4 = 4 \cdot 6$$

For any numbers a and b,

$$a \cdot b = b \cdot a$$

Associative Properties of Addition and Multiplication – Tab 4

Addition

The way in which addends are grouped does not change the sum.

$(4 + 3) + 5 = 4 + (3 + 5)$

$7 + 5 = 4 + 8$

For any numbers *a*, *b*, and *c*.

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

Multiplication

The way in which factors are grouped does not change the product.

$(4 \cdot 2) \cdot 3 = 4 \cdot (2 \cdot 3)$

$8 \cdot 3 = 4 \cdot 6$

For any number *a*, *b*, and *c*.

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

Distributive Property – Tab 5

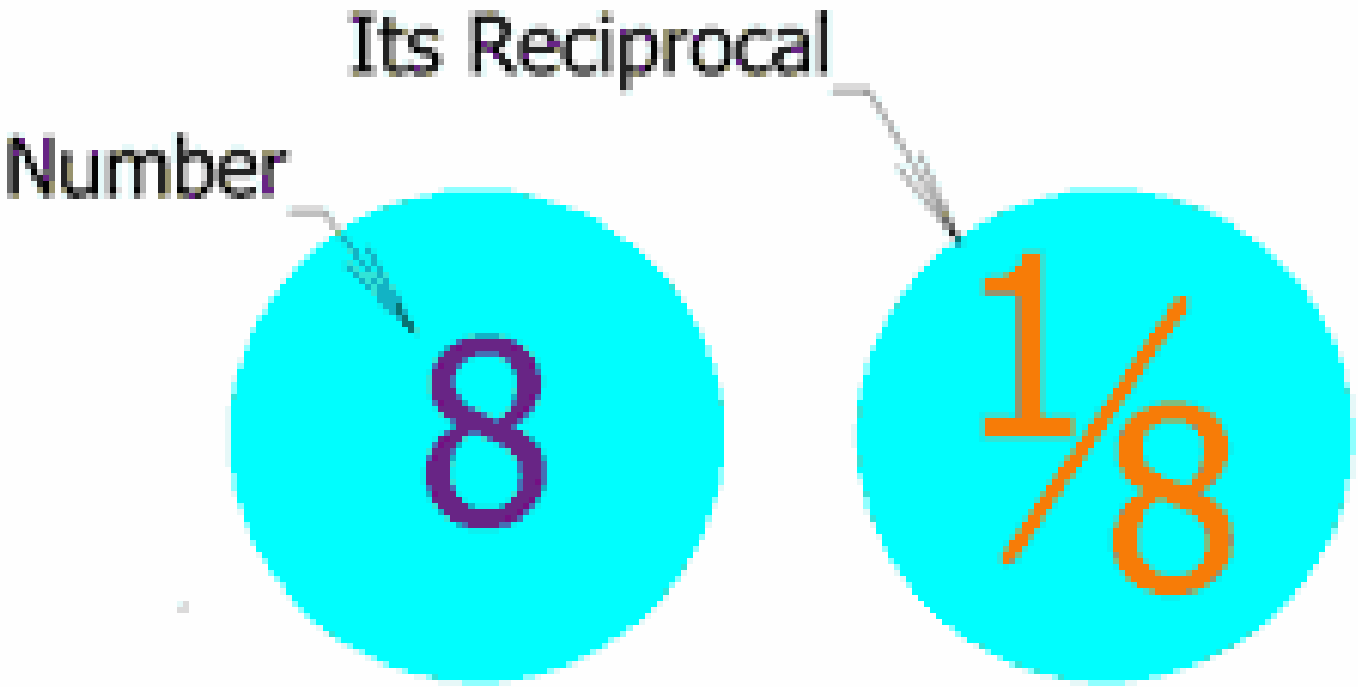
- Multiply numbers by breaking apart one of the numbers and writing it as a sum or difference.

1. $8\,(14) = 8\,(20 - 6) = 8 \cdot 20 - 8 \cdot 6 = 160 - 48 = 112$
2. $6\,(23) = 6\,(20 + 3) = 6 \cdot 20 + 6 \cdot 3 = 120 + 18 = 138$

3. In algebra – we multiply the **a** times both things in the parenthesis.
4. $a \cdot (b + c) = a \cdot b + a \cdot = ab + ac$
5. $2\,(a + b) = 2 \cdot a + 2 \cdot b = 2a + 2b$

Reciprocal

- **Reciprocal**
- *It is simply: 1 / number*



You used the Reciprocal when.....

To multiply fractions – you mulitply straight across.

2/3 x 4/5 = 8/15

Multiplicative Inverse – on back

- **A number times its reciprocal equals 1.**
- **Example:**
- The reciprocal of 4 is $1/4$
- The reciprocal of $1/4$ is 4 (back to 4 again)
- A number times its reciprocal is 1. $3/4 \cdot 4/3 = 12/12 = 1$

Additive Inverse – on the back

- Any number plus its opposite equals zero.

- $-2 + 2 = 0$
- $4 + -4 = 0$

Name the Property

1)$14 + 5 = 5 + 14$

Commutative Property of Addition

2)$25 \cdot 9 \cdot 4 = 9 \cdot 4 \cdot 25$

Commutative Property of Multiplication

3)$(y + 2) + 3 = y + (2 + 3)$

Associative Property of Addition

4) $4(5m) = (4 \cdot 5)m$

Associative Property of Multiplication

5) $3 \cdot 5 \cdot 0 = 0$

Multiplicative Property of Zero

6)$z + 0 = z$

Identity Property of Addition

7) $1 \cdot n = n$

Identity Property of Multiplication