

## Chapter 1 – Integers Study Card

### Vocabulary:

Additive inverse – the opposite of a number

Absolute value (  $|#|$  ) – the distance a number is from zero

Sum – the answer to an addition problem

Difference – the answer to a subtraction problem

Product – the answer to a multiplication problem

Quotient – the answer to a division problem

### Addition of Integers

Pos # + Pos # = Pos #

Ex:  $8 + 6 = 14$

Neg # + Neg # = Neg #

Ex:  $-7 + -5 = -12$

Pos # + Neg # or Neg # + Pos # = Either

Ex:  $-8 + 6 = -2$      $-4 + 9 = 5$

Remember use pictures if necessary (+/-) or

1. Drop the signs
2. Take the smaller # away from the larger #
3. Take the sign of the larger #

### Subtraction of Integers

ADD the OPPOSITE

$5 - -3 \rightarrow 5 + 3 = 8$

$-4 - 6 \rightarrow -4 + -6 = -10$

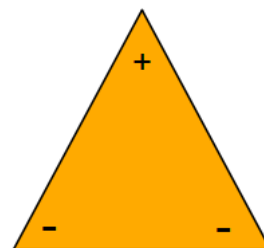
$-3 - -9 \rightarrow -3 + 9 = 6$

### Multiplication and Division of Integers

Rules for 2 factors:

- Signs are the same, product or quotient is positive
- Signs are different, product or quotient is negative

Ex:  $-4(-5) = 20$      $14 \div -7 = -2$      $\frac{-50}{5} = -10$



If they are 3 or more factors find the product of 2 factors at a time:

Ex:  $-3 \times 5 \times -2$      $-3 \times 5 = -15$      $-15 \times -2 = 30$

## Order of Operations

Steps: 1. Parentheses ( ), [ ] and Absolute Value

2. Exponents and Square Roots  $\sqrt{\quad}$
3. Multiplication and Division (left to right)
4. Addition and Subtraction (left to right)

$$\begin{aligned} & \boxed{-4} - 7 + 3^2 + -5 - -10 \\ & 4 - 7 + \boxed{3^2} + -5 - -10 \\ & \boxed{4-7} + 9 + -5 - -10 \\ & \boxed{-3+9} + -5 - -10 \\ & \boxed{6+5} - -10 \\ & 11 - -10 \\ & \textcircled{21} \end{aligned}$$

## Real Number Properties

**Commutative:** If the **order** of the addends or factors is **changed**, the sum or product remains the same

$$\text{Ex: } -3 + 7 = 7 + -3 \quad \text{or} \quad 9(-8) = -8(9)$$

**Associative:** If the order of the **groupings ( )** is **switched**, the sum or product remains the same

$$\text{Ex: } -2 + (9 + -1) = (-2 + 9) + -1 \quad \text{or} \quad (7 \times -2) \times 4 = 7 \times (-2 \times 4)$$

**Additive Identity:**  $-6 + 0 = -6$

**Identity**  $\rightarrow$  **Itself**

**Multiplicative Identity:**  $-5 \times 1 = -5$

**Distributive:** Take what is outside of parentheses and distribute to inside  
Distribute  $\rightarrow$  Multiply

$$\text{Ex: } -3 \times (4 + -6) = -3 \times 4 + -3 \times -6 \quad \text{or} \quad 7(5 - 1) = 7(5) - 7(1)$$

**Additive Inverse:** The sum of a number and its additive inverse is always zero.

$$\text{Ex: } -8 + 8 = 0 \quad \text{or} \quad 12 + -12 = 0$$

**Multiplicative Inverse:** The product of a number and its multiplicative inverse (reciprocal) is always one.

$$\text{Ex: } -4 \times -\frac{1}{4} = 1 \quad \text{or} \quad \frac{1}{8}(8) = 1$$