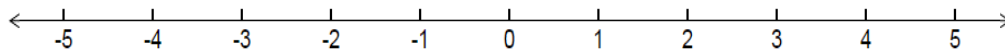


The Opposite and the Absolute Value

The **opposite** of a number (also known as the **additive inverse**) is the number that is the same distance from **0** on the number line.

Example 1:

The opposite of 3 is _____.



Answer: **-3**, since the distance from **0** to **3** on the number line is the **same** as the distance from **0** to **-3**.

Example 2:

The opposite of **-3** is _____.

Answer: _____.

Written in math terms:

$$\begin{array}{c} \swarrow \quad \nwarrow \quad \nwarrow \\ -(-3) = 3 \\ \swarrow \quad \nwarrow \\ \text{"the opposite of } -3 \text{ is } 3\text{"} \end{array}$$

The **absolute value** of a number represents the distance between **0** and the number on the number line.

The absolute value of **x** is written as **|x|**.

Example 3:

$$|-4| = \underline{\hspace{2cm}}$$

NOTE: The absolute value of a number is **always positive**, since it represents a **distance**.

Example 4:

Evaluate:

a) $|5| =$

b) $|-2| =$

c) $-|-10| =$

Formal Definition of Absolute Value:

$$|x| = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x < 0 \end{cases}$$

The Opposite and the Absolute Value

Practice Problems

1. What is the opposite of 9 ?
2. What is the opposite of -9 ?
3. What is the absolute value of 9 ?
4. What is the absolute value of -9 ?
5. What is the opposite of the absolute value of 9 ?
6. What is the opposite of the absolute value of -9 ?
7. Evaluate:
 - a) $|-3| =$
 - b) $-|-4| =$
 - c) $|-2| + |-3| =$