

Lesson 7.1: Absolute Value

Specific Outcome: Demonstrate an understanding of the absolute value of real numbers. (Algebra & Number: 1)

Absolute Values:

- Absolute value represents the distance from zero on a number line, regardless of the direction.

$$|-4| = 4$$

$$|4| = 4$$



- Vertical bars around a number or expression represent its absolute value: $|-24|$, $|3 - 12|$.
- Absolute value is always zero or positive.
 - The absolute value of a positive number is always positive: $|9| =$
 - The absolute value of a negative number is positive: $|-2| =$
 - The absolute value of zero is zero: $|0| =$

The absolute value of a real number a is defined as $|a| = \begin{cases} a, & \text{if } a \geq 0 \\ -a, & \text{if } a < 0 \end{cases}$

Example 1: Evaluate.

a) $|3|$

b) $|-7|$

c) $|-12|$

Example 2: Write the following real numbers in order from least to greatest.

$$|-10.1|, \left| -\frac{21}{2} \right|, -9.8, |10|, -10, |-9.9|, \left| -9\frac{7}{8} \right|, -9$$

- **Absolute values** should be treated in the same manner as brackets. Solve the expression inside the absolute value symbol before evaluating the absolute value. Pay close attention to BEDMAS rules.

Example 3: Evaluate.

a) $|2| - |3(-4)|$

b) $|5(-2)^2 + 7(-3) - 15|$

c) $5 - 3|2 - 7|$

d) $|-2(5 - 7)^2 + 6|$
| |

Example 4: The value of the absolute value expression, $|-4 + 13| + |6 - (-9)| - |8 - 17| + |-2|$, to the nearest tenth is _____.

(Record your answer in the numerical response box from left to right.)

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Example 5: If the graph of $y = h(x)$ passes through the point $(-2, -9)$, then the graph of $y = |h(x)|$ must pass through the point $(-2, a)$. The value of a is _____.

(Record your answer in the numerical response box from left to right.)

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