

41 - 7.1 Absolute Values**Key Ideas**

The **absolute value** of a real number x is the non-negative value of x without regard to its sign.

- $|5| = 5$
- $|-5| = 5$

In terms of Physics, the absolute value is analogous to the magnitude of the vector (how big the number is, regardless of sign/direction).

Part 1 - Absolute Value of Numbers

Q1: Evaluate the following:

$$|4| = 4$$

$$|-3| = 3$$

$$|16| = 16$$

$$|-200| = 200$$

$$|-35| = 35$$

$$|22| = 22$$

$$|-0.56| = 0.56$$

$$|3 \times 10^2| = 3 \times 10^2$$

Part 2 - Expressions with Absolute Values

Q2: Evaluate the following:

$$|5 - 8| + |-3| = 3$$

$$|4| - 5$$

$$|3^2 - 15| - 12$$

$$|4| - 5$$

$$|9 - 15| - 12$$

$$4 - 5$$

$$|-6| - 12$$

$$-1$$

$$6 - 12$$

$$-6$$

$$2|5 - 8| + 2$$

$$\frac{2}{3}|2^3 - 14|$$

$$9 - \frac{7}{2}|2 - 6|$$

$$2|-3| + 2$$

$$\frac{2}{3}|8 - 14|$$

$$9 - \frac{7}{2}|-4|$$

$$2(3) + 2$$

$$\frac{2}{3}|-6|$$

$$9 - \frac{7}{2}(4)$$

$$6 + 2$$

$$\frac{2}{3}(6)$$

$$9 - 14$$

$$8$$

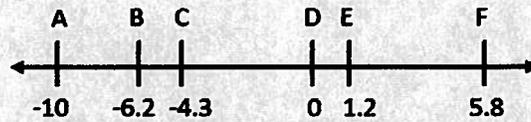
$$4$$

$$-5$$

Part 3 – Calculating Differences using Absolute Values

Use the following information to answer Q3:

Distances along a running path are marked, with a central gazebo marked as "0 km".



Q3: Determine the following distances:

A to B

$$|(-10) - (-6.2)|$$

$$|-3.8|$$

$$3.8$$

B to A

$$|(-6.2) - (-10)|$$

$$|3.8|$$

$$3.8$$

E to F

$$|(1.2) - (5.8)|$$

$$|-4.6|$$

$$4.6$$

A to E

$$|(-10) - (1.2)|$$

$$|-11.2|$$

$$11.2$$

C to E

$$|(-4.3) - (1.2)|$$

$$|-5.5|$$

$$5.5$$

F to B

$$|(5.8) - (-6.2)|$$

$$|12|$$

$$12$$