## Packet 2: Rational Numbers on the Number Line

Dear Parents/Guardians,

Packet 2 reviews rational number concepts from Grade 6, which includes extensive work with negative numbers so that students are prepared in the following packets to do operations on rational numbers.

Students graph rational numbers on a number line as well as ordered pairs on a coordinate plane. Students use arrows on the number lines to indicate direction and length to understand the meaning of opposites and absolute value. Encourage your student to practice using the number lines to locate points, direction and distance.
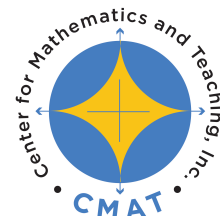
### Graphing Ordered Pairs on a Coordinate Plane

The diagram to the right is an example of a coordinate plane, with the x-axis and y-axis labeled. Points on the coordinate plane can be identified as an ordered pair $(x, y)$
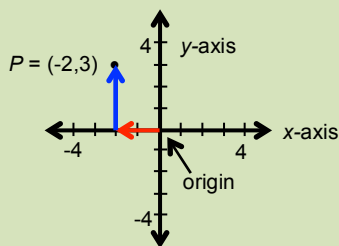


The origin is located at (0,0).

The x-coordinate indicates the direction and distance to move horizontally. The y-coordinate indicates the direction and distance to move vertically.

Example: To graph the point $P$(-2, 3) start at the origin. Move 2 units to the left and 3 units up. Note that order matters. The point (3, -2) indicates moving 3 units to the right and 2 units down, which is a different location.

### By the end of the packet, your student should know…

How to graph integers on a number line and as ordered pairs in the coordinate plane. Lesson 2.1

Opposites and absolute values Lesson 2.2

How to graph rational numbers on a number line and ordered pairs in the coordinate plane Lesson 2.3

### Additional Resources

Resource Guide (RG) Part 1, pages 28-30

### Graphing Rational Numbers on a Number Line

A number line is a visualization of the real numbers as a straight line. Usually tick marks are used to represent specific benchmark numbers. Number lines can go horizontally (like the examples below) or vertically.
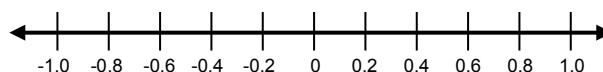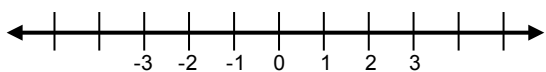


Number lines can go horizontally (like the ones above) or vertically. Students will use arrows on a number line to show distance and direction.



The arrow starts at -2 and indicates it is moving in a positive direction to get to 2. The arrow represents 4.
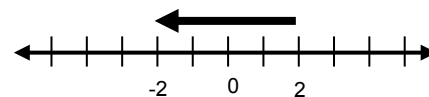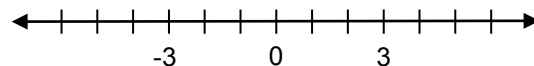
The arrow starts at 2 and indicates it is moving in a negative direction to get to -2. The arrow represents -4.

### Opposites and Absolute Value

The **opposite** of a number is its additive inverse. On a number line, the opposite of a number is its reflection through zero.

Example: The opposite of 3 is -3. Likewise, the opposite of -3 is 3.

The **absolute value** of a number $|x|$ is the distance from $x$ to zero on a number line.



Example, $|-3| = 3$, since the distance from 0 to 3 is 3. $|3| = 3$, as the distance from 0 to 3 is also 3.