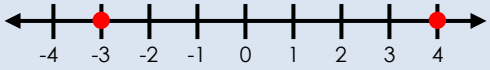
Unit 10: The Number Line and the Coordinate Plane

Dear Parents/Guardians,

Unit 10 introduces signed numbers on a number line and the coordinate plane. In Lesson 1, students represent integers on a number line and find their opposites and absolute values. Lesson 2 extends these ideas into rational numbers including fractions and decimals. In Lesson 3, students graph in all four quadrants of a coordinate plane. In Lesson 4, students graph polygons and reflect them across the *x*- axis and *y*-axis.

Extending the Number Line

Students locate rational numbers on number lines, both vertical and horizontal. Using number lines, students will compare and order rational numbers.

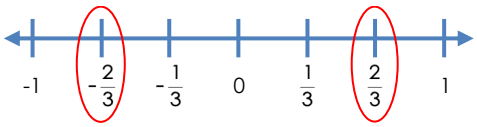


On a horizontal number line, the numbers further to the right are greater than the numbers to the left. 3 is further to the right than -4, so 3 is greater than -4.

$3 > -4$

Opposites and Absolute Value

The opposite of a number is the number on the other side of zero at the same distance from zero.



$-\frac{2}{3}$ and $\frac{2}{3}$ are opposites.

It is important to note that 0 is its own opposite.

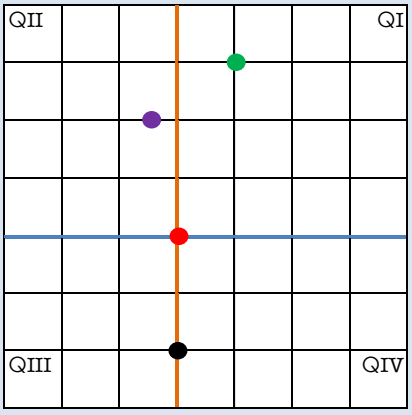
The absolute value of a number is the distance from the number to 0 on a number line. Distance is always greater than or equal to 0. We can represent the absolute value of any number x as $|x|$.

The absolute value of $-\frac{2}{3}$, expressed as $\left|-\frac{2}{3}\right|$ is $\frac{2}{3}$.

The absolute value of $\frac{2}{3}$, expressed as $\left|\frac{2}{3}\right|$ is also $\frac{2}{3}$. Opposites have the same absolute value since they are the same distance from 0 on the number line.

Graphing on the Coordinate Plane

A coordinate plane is determined by a horizontal number line (called the x-axis) and a vertical number line (called the y-axis), intersecting at the origin (0,0). There are four quadrants within the coordinate plane to help locate points.



Points are located using ordered pairs *(x,y)*.

(0,0) is located at the origin

(1,3) is located in Quadrant I (QI)

(0.5, -2) is located in Quadrant IV (QIV)

(-2,0) is located on the *y*-axis

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Math Links GRADE 6

By the end of the unit, your student should know…

- How to represent rational numbers on a number line [Lessons 10.1, 10.2]
- How to find the opposite and absolute value of rational numbers [Lessons 10.1, 10.2]
- How to write and graph solutions to equation and inequalities on number lines [Lessons 10.1, 10.2; Please see video for additional support]
- How to scale coordinate grids and graph ordered pairs [Lessons 10.3, 10.4]
- How to draw polygons in the plane given the coordinates of the vertices [Lesson 10.4]
- How to graph figures and their reflected images across axes [Lesson 10.4]

Additional Resources

- For definitions and additional notes please refer to section 10.6.
- For graphing inequalities: https://bit.ly/3euEsH3
- For Reflections across axis: https://bit.ly/30Z4Eph