Big Ideas Math: Green

Parent Newsletter

Chapter 6: Integers and the Coordinate Plane

Standards

Common Core:

6.NS.5: Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

6.NS.6: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

6.NS.7: Understand ordering and absolute value of rational numbers.

6.NS.8: Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Key Terms

Positive numbers are greater than 0. They can be written with or without a positive sign (+).

Negative numbers are less than 0. They are written with a negative sign (−).

Two numbers that are the same distance from 0 on a number line, but on opposite sides of 0, are called ***opposites***.

Integers are the set of whole numbers and their opposites.

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

Students will...

Understand positive and negative integers and use them to describe real-life situations.

Graph integers on a number line.

Use a number line to compare positive and negative integers.

Use a number line to order positive and negative integers for real-life situations.

Understand positive and negative numbers and use them to describe real-life situations.

Graph numbers on a number line.

Find the absolute value of numbers.

Use absolute value to compare numbers in real-life situations.

Describe the locations of points in the coordinate plane.

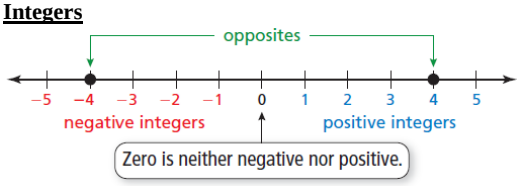
Plot points in the coordinate plane given ordered pairs.

Find distances between points in the coordinate plane.

Understand reflections of points in the coordinate plane.

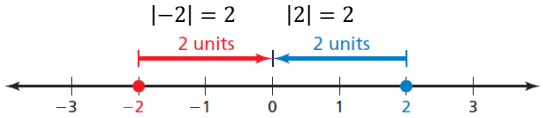
Key Ideas

Integers



Absolute Value

The absolute value of a number a is written as $|a|$.

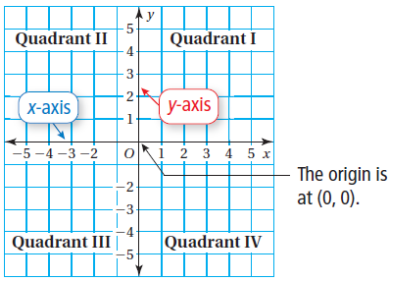


The Coordinate Plane

A **coordinate plane** is formed by the intersection of a horizontal number line and a vertical number line. The number lines intersect at the **origin** and separate the coordinate plane into four regions called **quadrants**.

An *ordered pair* is used to locate a point in a coordinate plane.

ordered pair: (4, −2)

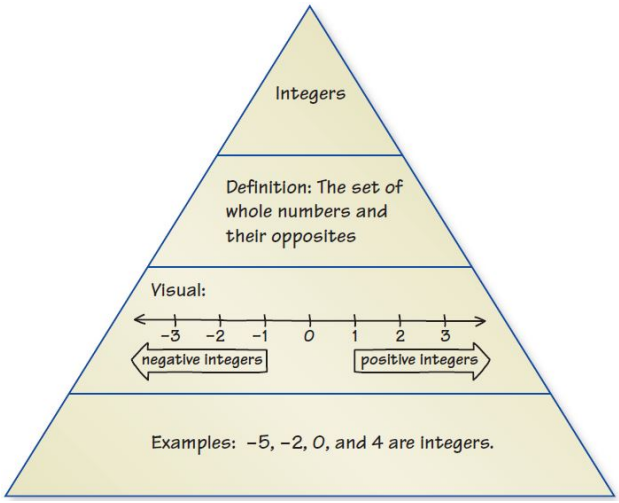


Reflecting a Point in the Coordinate Plane

- To reflect a point in the x-axis, use the same x-coordinate and take the opposite of the y-coordinate.
- To reflect a point in the y-axis, use the same y-coordinate and take the opposite of the x-coordinate.

Reference Tools

A **Summary Triangle** can be used to explain a concept. Typically, the summary triangle is divided into 3 or 4 parts. In the top part, students write the concept being explained. In the middle part(s), students write any procedure, explanation, description, definition, theorem, and/or formula(s). In the bottom part, students write an example to illustrate the concept. A summary triangle can be used as an assessment tool, in which blanks are left for students to complete. Also, students can place their summary triangles on note cards to use as a quick study reference.



Quick Review

- It is easier to compare numbers if they are both in the same form.
- There are three sets of numbers: positive integers, negative integers, and 0. Zero is neither positive nor negative.
- On a horizontal number line, numbers to the left are less than numbers to the right. Numbers to the right are greater than numbers to the left.
- On a vertical number line, numbers below are less than numbers above. Numbers above are greater than numbers below.
- If two numbers A and B are positive and $A < B$, then $-B < -A$.
- The absolute value of a number is the *distance* from 0. Distance is a positive number or 0.
- The order in which you plot points on the coordinate plane is important.
  - The x-coordinate is always first. It tells us how far to go horizontally, and in which direction.
  - The y-coordinate is always second. It tells us how far to go vertically, and in which direction.

Essential Questions

How can you represent numbers that are less than 0?

How can you use a number line to order real-life events?

How can you use a number line to compare positive and negative fractions and decimals?

How can you describe how far an object is from sea level?

How can you graph and locate points that contain negative numbers in a coordinate plane?

Games

- Order Matters
- Six in a Row

These are available online in the *Game Closet* at www.bigideasmath.com.

What's the Point?

The ability to use integers and the coordinate plane is very useful in real life for events like showing trends in the stock market. Ask your student to research the closing price for a company's stock over a week. Then have them graph the results in a line graph and interpret the results. Would they invest in that company? Why or why not?

The STEM Videos available online show ways to use mathematics in real-life situations.
The Chapter 6: Tuning a Guitar STEM Video is available online at www.bigideasmath.com.