**Integers**

The absolute value of a number \(a\) is written as \(|a|\).

\[ |−2| = 2 \quad |2| = 2 \]

**Absolute Value**

The absolute value of a number \(a\) is written as \(|a|\).

\[ |−2| = 2 \quad |2| = 2 \]

**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: \((4, −2)\)

**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.
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.