

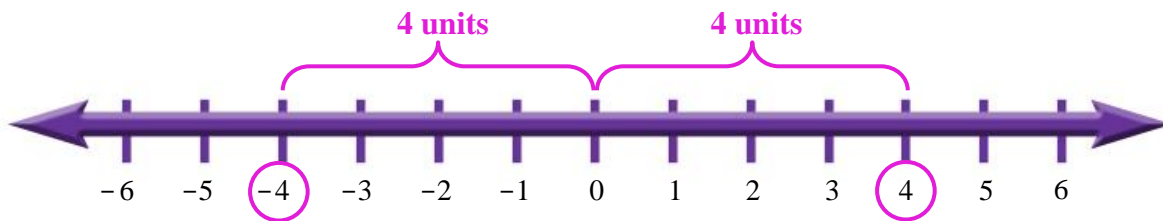
Issues with Integers? Self-Help Guide!

Integer Basics

Numbers have two characteristics: magnitude and direction. The magnitude is the distance that the number is from zero on a number line. The direction is given by the sign: negative numbers are to the left of zero and positive numbers are to the right. If a number has no sign, it is understood to be positive.

Note the location of +4 on the number line below and its relationship to -4. Both numbers are 4 units from zero, but on opposite sides of zero. 4 and -4 are often called “opposites” or “additive inverses.”

The numbers labeled on the number line below are **integers** which are whole numbers (not fractions or decimals) and their opposites. Note: Zero has no opposite because it is neither positive nor negative.



Because both +4 and -4 are the same distance from zero, their magnitude or **absolute value** is the same. The absolute value of a number n ($|n|$) is defined as the distance that the number is from zero on a number line. For example:

$$|4| = 4$$

$$|-4| = 4$$

Since distance cannot be negative, the absolute value cannot be negative. The absolute value of every non-zero real number is always positive, and the absolute value of zero is 0 because zero is not positive or negative.

There are a number of methods used to teach operations with integers and eventually operations with all real numbers from movement on the number line to memorizing specific rules. A more visual approach will be presented here, using students’ understanding that being “in the red” indicates an amount owed and being “in the black” indicates a positive amount available for use, the preferred bottom line in business. Based on these concepts, a black chip or circle will represent +1 and a red chip or circle will represent -1.

$$+1 = \text{black chip with } +$$

$$-1 = \text{red chip with } -$$

Note that +1 and -1 are opposites or additive inverses. Combining a number with its additive inverse produces zero (they cancel each other).

Manipulatives such as checkers can easily be used to mirror the processes to be presented.