

Grade 6 · Integers, Opposites and Absolute Value · Lesson

Common Core 6.NS.C.5, 6.NS.C.6a, 6.NS.C.7 · mathovore.fr

An integer is a positive whole number, zero, or a negative whole number, and a rational number is any number that can be written as a fraction. Opposites are the same distance from 0 on opposite sides of a number line. The absolute value of a number is its distance from 0, so it is never negative.

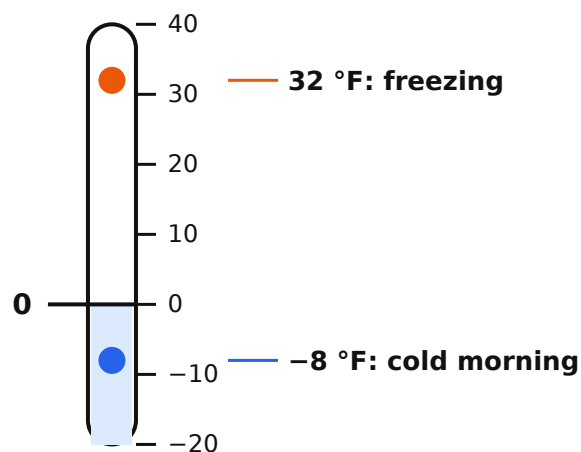
Grade 6 Common Core: 6.NS.C.5 · 6.NS.C.6a · 6.NS.C.7

Key facts:

- Positive numbers are greater than 0 and negative numbers are less than 0.
- Opposites are the same distance from 0, and the opposite of 0 is 0.
- On a number line, the number farther to the right is always greater.
- Absolute value is the distance from 0, so it is never negative.
- A negative number with a greater absolute value is the lesser number.

What are positive and negative numbers?

Positive numbers describe amounts greater than zero, such as a temperature of 32°F or a hill that is 60 feet above sea level. Negative numbers describe amounts less than zero, such as -8°F , a diver at -40 feet, or a debt of -25 dollars. Zero is neither positive nor negative.



A thermometer shows positive and negative temperatures.

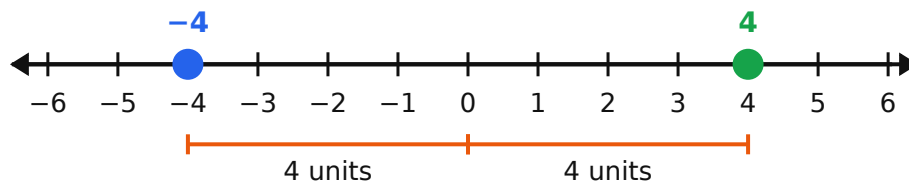
Vocabulary

Integers: positive whole numbers, zero, and negative whole numbers. **Rational numbers:** numbers that can be written as a fraction $\frac{a}{b}$ with $b \neq 0$, such as $-\frac{3}{4}$, 0.5, and -6 .

Opposites: two numbers the same distance from 0 on opposite sides. **Absolute value:** the distance of a number from 0, written $|x|$.

What are opposites on a number line?

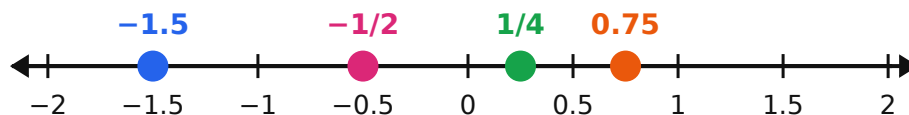
The opposite of 4 is -4 , the opposite of -7 is 7, and the opposite of 0 is 0. Taking the opposite twice returns the original number, so $-(-7) = 7$.



Opposites are the same distance from 0.

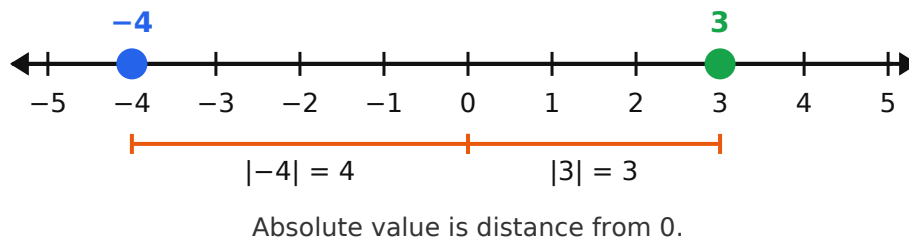
How do you compare and order rational numbers?

On a horizontal number line, the number farther to the right is greater. Every negative number is less than every positive number, and among negative numbers, the one closer to 0 is greater. When numbers appear in different forms, write them all as decimals first. Since $-\frac{1}{2} = -0.5$, the numbers in order are $-1.5 < -\frac{1}{2} < \frac{1}{4} < 0.75$.



Rational numbers in order from left to right.

Statement	Why it is true
$-9 < -2$	-9 is to the left of -2
$3 > -10$	3 is to the right of -10
$0 > -0.5$	-0.5 is to the left of 0



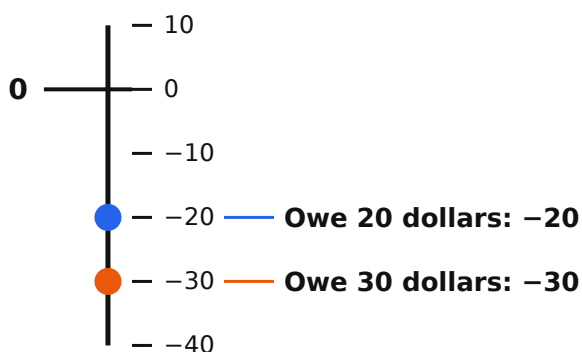
What is absolute value and how do you find it?

Absolute value measures distance, so it is never negative. Here is how to find $|-4|$.

1. Locate -4 on a number line.
2. Count the units from -4 to 0. There are 4 units.
3. Write the distance: $|-4| = 4$.
4. Check a positive number the same way: $|3| = 3$ because 3 is 3 units from 0.
5. Remember that opposites have equal absolute values, so $|-4| = |4|$.

Is a number with a greater absolute value always greater?

No. Absolute value tells how far from 0, while order tells position on the line. A debt of 30 dollars is -30 and a debt of 20 dollars is -20 . Since $-30 < -20$, the larger debt is the lesser number, even though $|-30| = 30$ is greater than $|-20| = 20$.



The larger debt is lower on the scale: $-30 < -20$.

Integers, Opposites and Absolute Value: frequently asked questions

What is an integer?

An integer is a positive whole number, zero, or a negative whole number. Numbers such as 7, 0, and -12 are integers, but 2.5 and $\frac{1}{2}$ are not.

Is zero positive or negative?

Zero is neither positive nor negative. It is its own opposite, and it separates the positive numbers from the negative numbers on the number line.

How do you tell which of two negative numbers is greater?

The negative number closer to zero is greater. For example, $-3 > -8$ because -3 is farther to the right on the number line.

Why is absolute value never negative?

Absolute value is a distance, and a distance cannot be less than zero. The absolute value of 0 is 0, and every other number has a positive absolute value.

How do you compare a fraction and a decimal?

Write both numbers in the same form, usually as decimals, and then compare their places on the number line. For example, $\frac{1}{4} = 0.25$, which is less than 0.3.