

Dear Family,

Your child is learning to understand how to add positive and negative integers.



All of the whole numbers and their opposites are called integers. The numbers 4, -8 , 21, -17 , 158, and $-1,000$ are examples of integers. Integers are used to represent quantities in real-life situations that involve positive and negative numbers. Here are some examples of situations in which you might use integers:

- to describe whole-dollar deposits and withdrawals in a bank account
- to represent elevations above or below sea level
- to describe stock market gains and losses
- to report temperatures above and below 0 degrees

Just like you can add whole numbers, you can also add integers. If you add an integer to its opposite, the sum is 0. For example, 4 and -4 are opposites.

$$4 + (-4) = 0 \qquad (-4) + 4 = 0$$

Opposites like 4 and -4 are said to be *additive inverses* because their sum is 0. Any two numbers whose sum is 0 are additive inverses.

Consider this situation:

A fisherman is fishing on a bridge that is 3 feet above the surface of a river. The bottom of the river is 12 feet below the bridge. What is the position of the bottom of the river relative to the surface of the water?



The next page shows two different ways your child may use integer addition to find the position of the bottom of the river relative to the surface of the water.



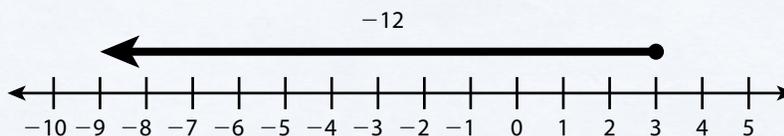
Understand Addition of Positive and Negative Integers: Sample Solution

A fisherman is fishing on a bridge that is 3 feet above the surface of a river. The bottom of the river is 12 feet below the bridge. What is the position of the bottom of the river relative to the surface of the water?

To find the position of the bottom of the river relative to the surface of the water, you need to add -12 to 3 .

One way:

Use a number line to add.



$$3 + (-12) = -9$$

Another way:

Break apart, or decompose, numbers to form additive inverses.

You can think of -12 as $(-3) + (-9)$.

$$\begin{aligned} 3 + (-12) &= 3 + (-3) + (-9) \\ &= [3 + (-3)] + (-9) \\ &= 0 + (-9) \\ &= -9 \end{aligned}$$

Answer: Both methods show that adding -12 to 3 gives a sum of -9 , so the bottom of the river is -9 feet from the surface of the river.

