

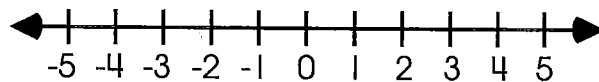


## What Are Integers?

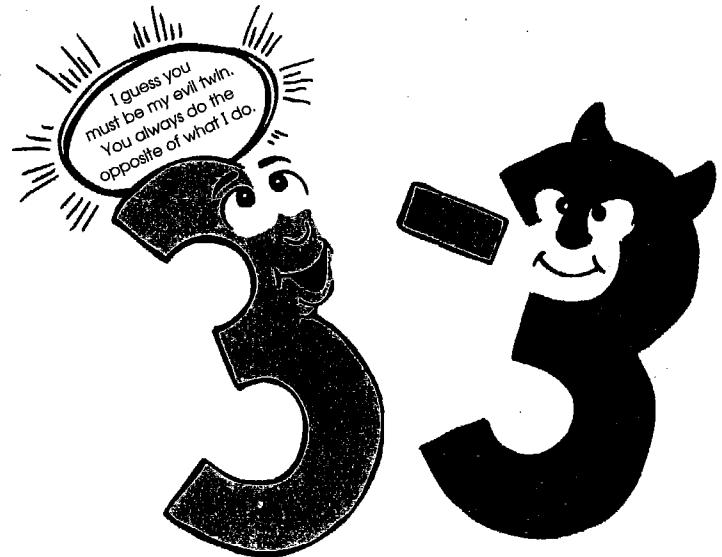
A set of integers consists of all positive whole numbers, their negative opposites, and zero.

$$\{ \dots, -3, -2, -1, 0, 1, 2, 3 \dots \}$$

On the number line, a set of integers could look like this:

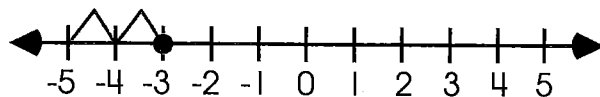


You have probably never thought of numbers as having opposites. The opposite of any number can be found on the number line. A number's opposite lies the same distance from zero on the opposite side of the number line. So, the opposite of 3 is -3. 3 and -3 both lie three units away from zero, one on its right side and the other on its left. The opposite of -3 is 3.



### Adding Integers

When you first learned to add, you may have used a number line. To add 3 and 2, you found that you could start on the 3 and jump two units to the right and land on 5. You can use the number line to add integers, too. The only difference is that when you see a negative number, you move in the opposite direction as you would if the number were positive. For example, to add -3 and -2, you start on -3. When you add positive numbers, you always move to the right. But since you are adding negative numbers, you move to the left.

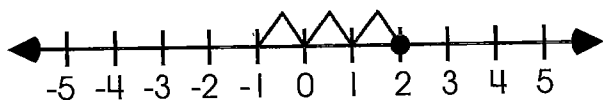


$$-3 + -2 = -5$$

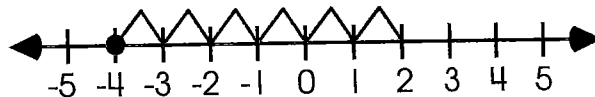


## What Are Integers? (continued)

The same can be done if only one of the numbers is negative.



$$2 + -3 = -1$$



$$-4 + 6 = 2$$

Look carefully at the second example above. Why should you move to the right instead of the left? In this case, because you are adding a positive number to a negative number, you move to the right. When the number you are adding is positive, you move to the right.

But how does this work in the real world? When are negative numbers used? One area in which negative numbers come up a great deal is money. The financial account of the U.S. government has a negative balance. The government is several billion dollars in debt. Whenever you owe someone money, you are in debt. Your debt can be described as a negative number. Below are two examples of how negative numbers are used.

**Example A:** You have borrowed \$25 from your mom. (Since this is an amount you owe, it can be described as -25.) After earning some money from babysitting, you pay your mom \$12. (This is your payback amount. It is positive.) How much do you still owe your mom? This can be answered by solving the following equation:

$$-25 + 12 = -13$$

You still owe your mom \$13.



**Example B:** After paying your mom \$12 of what you owe her, you find you need to borrow an additional \$30. How much are you now in debt?

$$-13 + -30 = -43$$

You are now \$43 in debt to your mom.