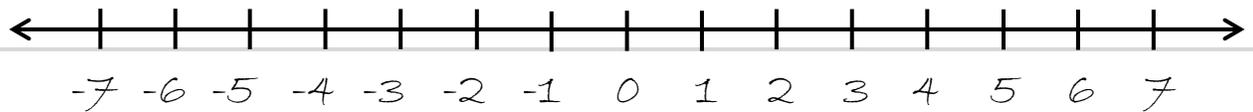


# Addition and Perimeter

## Objective 1

### Understand the Number Line



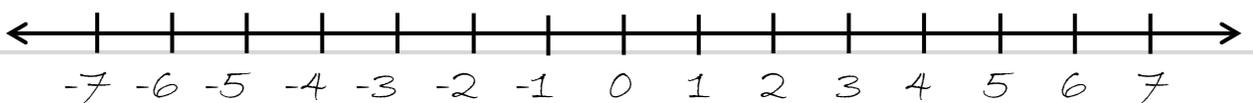
On the number line, zero is sometimes called the \_\_\_\_\_ of the number line. The numbers to the right of the zero are \_\_\_\_\_ and the numbers to the left of zero are \_\_\_\_\_.

## Objective 2

### Understand addition on a Number Line

Note: When adding positive numbers we move to the right on the number line.

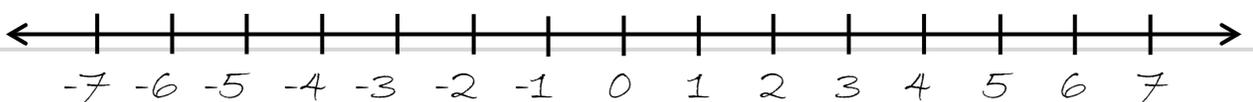
**Example 1:** Evaluate the expression  $-6 + 5$ .



Start at -6 and move to the right 5 units.

$$-6 + 5 =$$

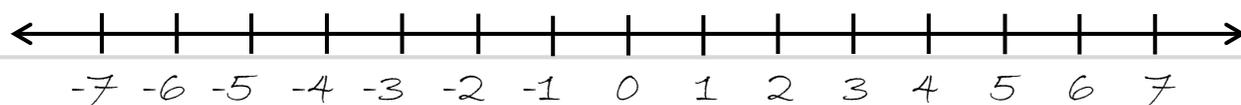
**Example 2:** Evaluate the expression  $-4 + 10$ .



Start at -4 and move to the right 10 units.

$$-4 + 10 =$$

**Example 3:** Use the number line to determine what number must be added to  $-3$  to get  $7$ .



Answer the following homework questions.

In Exercises 1 - 15, use a number line to evaluate each expression.

1)  $-5 + 10$

6)  $3 + 4$

11)  $5 + 4 + 5$

2)  $-2 + 10$

7)  $7 + 2$

12)  $3 + 8 + 7$

3)  $-8 + 10$

8)  $4 + 5$

13)  $-8 + 6 + 8$

4)  $-1 + 10$

9)  $5 + 1$

14)  $-4 + 2 + 4$

5)  $-9 + 10$

10)  $6 + 0$

15)  $-15 + 10 + 20$

### Objective 3

Write a mathematical expression using words.

### Definition

The sum of two numbers  $a$  and  $b$  is written  $a + b$ . The word sum indicates addition.

**Example 4:** Using the word sum, write " $4 + 9$ " as a word statement. Find the value of the sum.

Answer: The sum of four and nine. The value of the sum is 13.

**Example 5:** Using the word sum, write " $-3 + 8$ " as a word statement. Find the value of the sum.

Answer: The sum of negative three and eight. The value of the sum is 5.

## Objective 4 Perform Addition using the Vertical Format

When finding sums of large numbers, we can use the vertical format to help us organize our work.

**Example 6:** Calculate the sum of 311, 54, and 32.

We will use the vertical format to get the result. Be sure to line up the numbers in columns according to place value.

$$\begin{array}{r}
 311 \\
 54 \\
 + 32 \\
 \hline
 397
 \end{array}$$

Note: In this problem we did not have any "carry over". When the sum of the digits in a column is greater than 9, we must "carry over" to the next place value column moving to the left. This process is demonstrated in the next example.

**Example 6:** Calculate  $364 + 178 + 95$ .

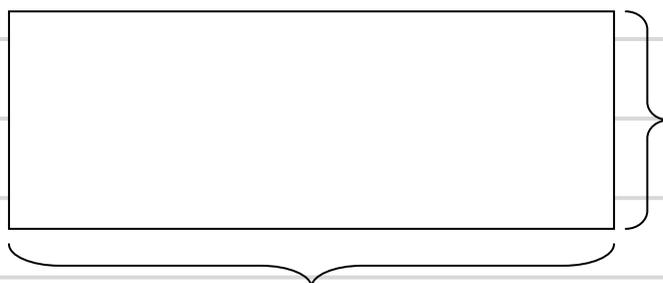
$$\begin{array}{r}
 \overset{2}{\phantom{0}} \overset{1}{\phantom{0}} \leftarrow \\
 364 \\
 178 \\
 + 85 \\
 \hline
 627
 \end{array}$$

These are the numbers that have been carried over. Remember, this will occur when the sum of the digits in any column is greater than 9.

## Objective 5 Understand Perimeter

The **perimeter** of a shape is defined to be the **sum** of its side lengths. We often use the capital letter **P** to represent perimeter.

For rectangles:



This side length is labeled as the \_\_\_\_\_ of the rectangle.

This side length is labeled as the \_\_\_\_\_ of the rectangle.

**Example 6:** Find the perimeter of the rectangle.



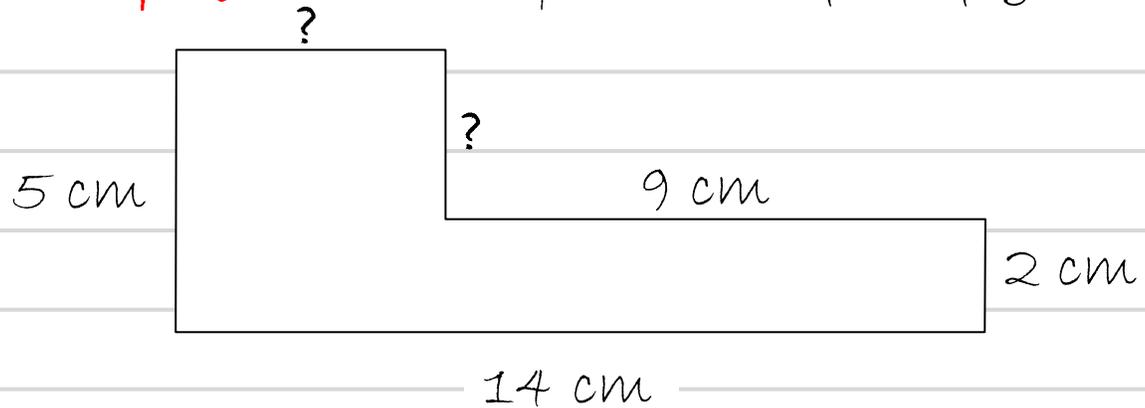
3 in

7 in

$$P = \underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$$

Note: Don't forget to include the units of measurement in your final answer!

**Example 7:** Find the perimeter of the figure.

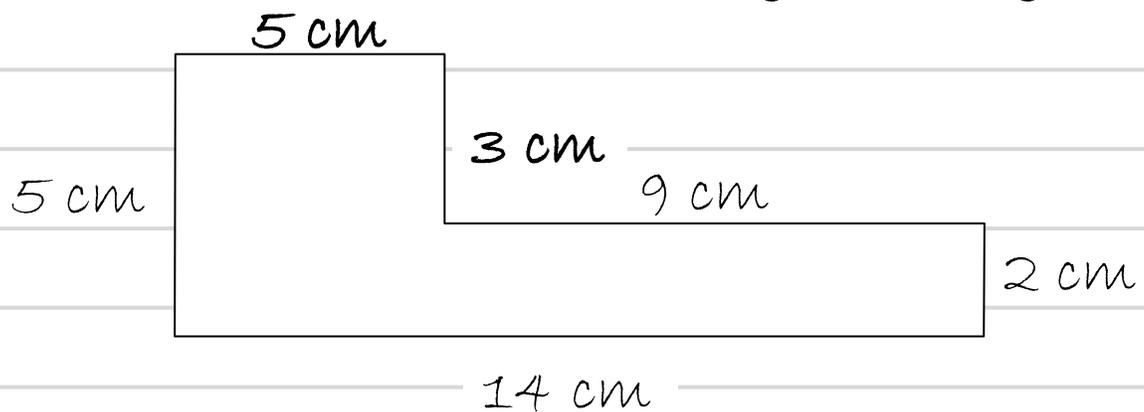


Notice that we must first find the two missing side lengths of the figure before we find its perimeter.

Let's begin by finding the missing horizontal side length. Since the sum of the missing length and the 9 cm length must equal 14 cm, we ask ourselves "what number do we add to 9 to get 14?" The answer is \_\_\_\_\_.

Next we find the missing vertical side length. Since the sum of the missing length and the 2 cm length must equal 5 cm, we ask ourselves "what number do we add to 2 to get 5?" The answer is \_\_\_\_\_.

Now we can label the missing side lengths.



To find the perimeter we sum up all the side lengths.

$$P =$$

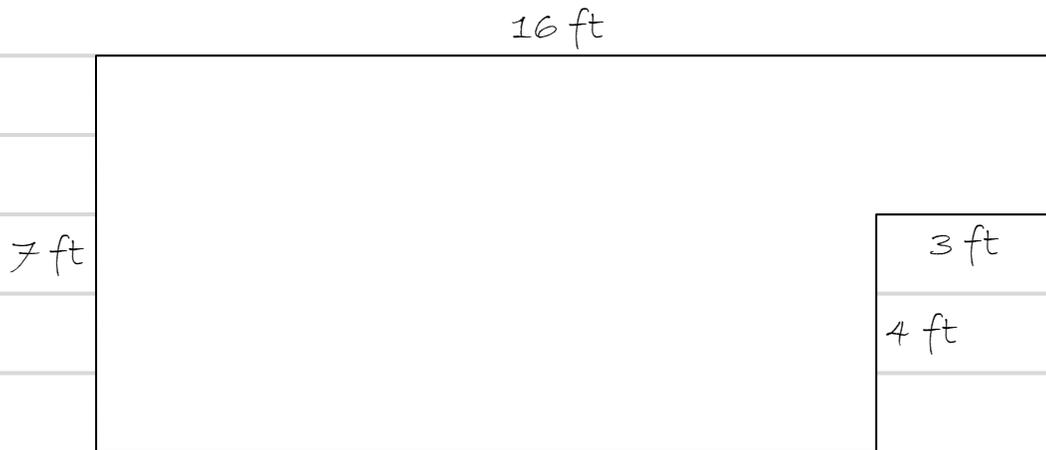
Answer the following homework questions.

- 16) The word "sum" is used to represent \_\_\_\_\_.
- 17) Write "the sum of 8 and 3" using math symbols.
- 18) Write "the sum of  $x$  and  $y$ " using math symbols.
- 19) Using words, write " $-7 + 13$ " using the word sum and evaluate the expression.

In Exercises 20 - 25, write in the correct number to make the equation true.

- 20)  $2 + \underline{\quad} = 7$       22)  $8 + \underline{\quad} = 11$       24)  $13 + \underline{\quad} = 21$
- 21)  $-2 + \underline{\quad} = 7$       23)  $-8 + \underline{\quad} = 11$       25)  $17 + \underline{\quad} = 24$

26) Find the perimeter of the figure below.



27) Find the perimeter of the figure below.

