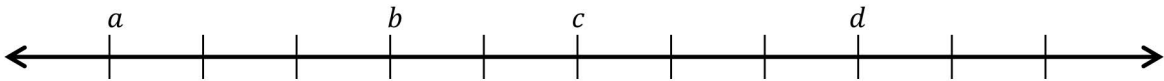


Name _____

Date _____

Positive and Negative Numbers on the Number Line— Opposite Direction and Value

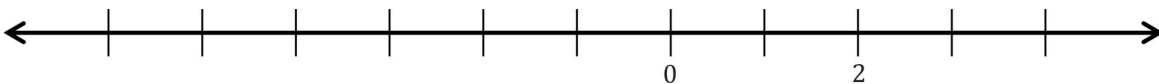
1. If zero lies between a and d , give one set of possible values for a , b , c , and d .



2. Below is a list of numbers in order from least to greatest. Use what you know about the number line to complete the list of numbers by filling in the blanks with the missing integers.

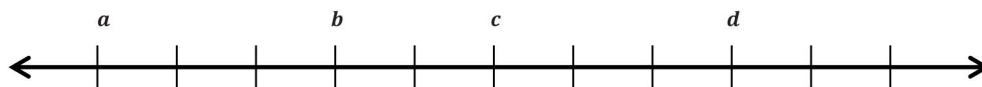
$-6, -5, \underline{\hspace{1cm}}, -3, -2, -1, \underline{\hspace{1cm}}, 1, 2, \underline{\hspace{1cm}}, 4, \underline{\hspace{1cm}}, 6$

3. Complete the number line scale. Explain and show how to find 2 and the opposite of 2 on a number line.



1. Draw a number line and create a scale for the number line in order to plot the points -2 , 4 , and 6 .
 - a. Graph each point and its opposite on the number line.
 - b. Explain how you found the opposite of each point.
2. Carlos uses a vertical number line to graph the points -4 , -2 , 3 , and 4 . He notices that -4 is closer to zero than -2 . He is not sure about his diagram. Use what you know about a vertical number line to determine if Carlos made a mistake or not. Support your explanation with a number line diagram.
3. Create a scale in order to graph the numbers -12 through 12 on a number line. What does each tick mark represent?
4. Choose an integer between -5 and -10 . Label it R on the number line created in Problem 3 and complete the following tasks.
 - a. What is the opposite of R ? Label it Q .
 - b. State a positive integer greater than Q . Label it T .
 - c. State a negative integer greater than R . Label it S .
 - d. State a negative integer less than R . Label it U .
 - e. State an integer between R and Q . Label it V .
5. Will the opposite of a positive number *always*, *sometimes*, or *never* be a positive number? Explain your reasoning.
6. Will the opposite of zero *always*, *sometimes*, or *never* be zero? Explain your reasoning.
7. Will the opposite of a number *always*, *sometimes*, or *never* be greater than the number itself? Explain your reasoning. Provide an example to support your reasoning.

1. If zero lies between a and d , give one set of possible values for a , b , c , and d .



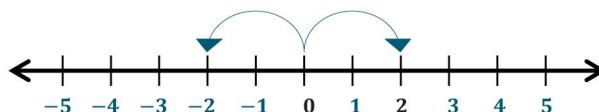
Answers will vary. One possible answer is $a: -4$; $b: -1$; $c: 1$; $d: 4$

2. Below is a list of numbers in order from least to greatest. Use what you know about the number line to complete the list of numbers by filling in the blanks with the missing integers.

$-6, -5, \underline{-4}, -3, -2, -1, \underline{0}, 1, 2, \underline{3}, 4, \underline{5}, 6$

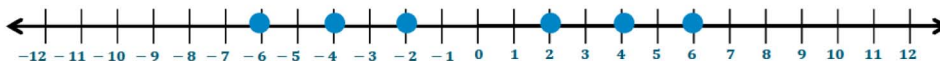
3. Complete the number line scale. Explain and show how to find 2 and the opposite of 2 on a number line.

I would start at zero and move 2 units to the left to locate the number -2 on the number line. So to locate 2, I would start at zero and move 2 units to the right (the opposite direction).



1. Draw a number line and create a scale for the number line in order to plot the points -2 , 4 , and 6 .

- a. Graph each point and its opposite on the number line.

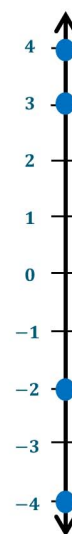


- b. Explain how you found the opposite of each point.

To graph each point, I started at zero and moved right or left based on the sign and number (to the right for a positive number and to the left for a negative number). To graph the opposites, I started at zero, but this time I moved in the opposite direction the same number of times.

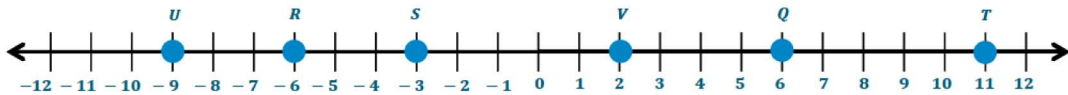
2. Carlos uses a vertical number line to graph the points -4 , -2 , 3 , and 4 . He notices that -4 is closer to zero than -2 . He is not sure about his diagram. Use what you know about a vertical number line to determine if Carlos made a mistake or not. Support your explanation with a number line diagram.

Carlos made a mistake because -4 is less than -2 , so it should be further down the number line. Starting at zero, negative numbers decrease as we look farther below zero. So, -2 lies before -4 on a number line since -2 is 2 units below zero and -4 is 4 units below zero.



3. Create a scale in order to graph the numbers -12 through 12 on a number line. What does each tick mark represent?

Each tick mark represents 1 unit.



4. Choose an integer between -5 and -10 . Label it R on the number line created in Problem 3 and complete the following tasks.

Answers may vary. Refer to the number line above for sample student work. $-6, -7, -8,$ or -9

- a. What is the opposite of R ? Label it Q .

Answers will vary. 6

- b. State a positive integer greater than Q . Label it T .

Answers will vary. 11

- c. State a negative integer greater than R . Label it S .

Answers will vary. -3

- d. State a negative integer less than R . Label it U .

Answers will vary. -9

- e. State an integer between R and Q . Label it V .

Answers will vary. 2

5. Will the opposite of a positive number *always, sometimes, or never* be a positive number? Explain your reasoning.

The opposite of a positive number will never be a positive number. For two nonzero numbers to be opposites, zero has to be in between both numbers, and the distance from zero to one number has to equal the distance between zero and the other number.

6. Will the opposite of zero *always, sometimes, or never* be zero?

The opposite of zero will always be zero because zero is its own opposite.

7. Will the opposite of a number *always, sometimes, or never* be greater than the number itself? Explain your reasoning. Provide an example to support your reasoning.

The opposite of a number will sometimes be greater than the number itself because it depends on the given number. For example, if the number given is -6 , then the opposite is 6 , which is greater than -6 . If the number is 5 , then the opposite is -5 , which is not greater than 5 . If the number is 0 , then the opposite is 0 , which is never greater than itself.