

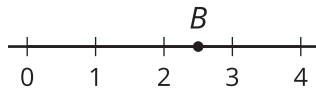


Points on the Number Line

Let's plot positive and negative numbers on the number line.

2.1 A Point on the Number Line

Which of the following numbers could be represented by point B ?



2.45

 $\frac{2}{5}$ $\frac{5}{2}$ $\frac{35}{10}$

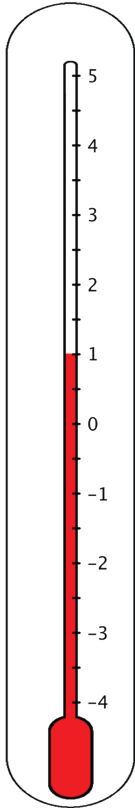
2.11

-2.5

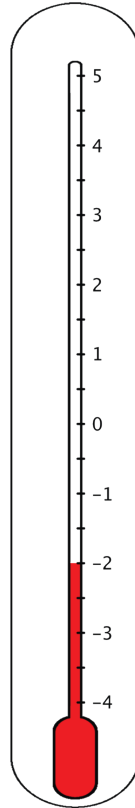
2.2 What's the Temperature?

1. Here are five thermometers. The first four thermometers show temperatures in degrees Celsius ($^{\circ}\text{C}$). Write the temperatures in the blanks.

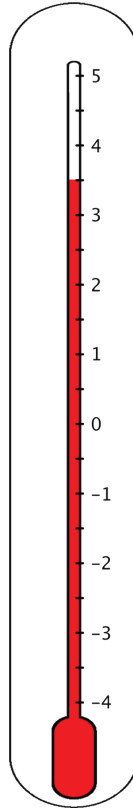
a. _____



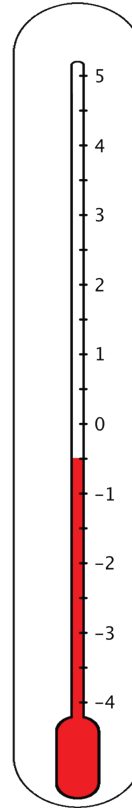
b. _____



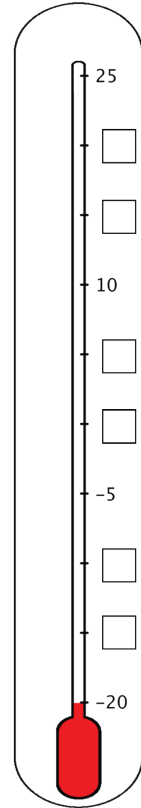
c. _____



d. _____

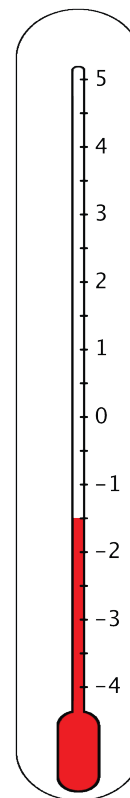


e. _____



2. The last thermometer is missing some numbers. Write them in the boxes.

3. Elena says that the thermometer shown here reads -2.5°C because the line is above -2°C . Jada says that it is -1.5°C . Do you agree with either of them? Explain your reasoning.



2.3

Folded Number Lines

Your teacher will give you a sheet of tracing paper. Follow the steps to make your own number line.

- Use a straightedge or a ruler to draw a horizontal line. Mark the middle point of the line, and label it 0.
- To the right of 0, draw tick marks that are 1 centimeter apart. Label the tick marks 1, 2, 3, . . . , 10. This represents the positive side of your number line.
- Fold your paper so that a vertical crease goes through 0 and the two sides of the number line match up perfectly.
- Use the fold to help you trace the tick marks that you already drew onto the opposite side of the number line. Unfold and label the tick marks -1, -2, -3. . . -10. This represents the negative side of your number line.

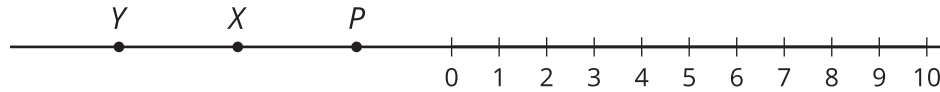
1. Use your number line to answer these questions:

- a. Which number is the same distance away from 0 as is the number 4?
- b. Which number is the same distance away from 0 as is the number -7?
- c. Two numbers that are the same distance from 0 on the number line are called **opposites**. Find another pair of opposites on the number line.
- d. Choose a positive number and a negative number that is each farther away from 0 than is the number 5.
- e. Choose a positive number and a negative number that is each farther away from 0 than is the number -2.

Pause here so your teacher can review your work.



2. Here is a number line with some points labeled with letters. What are the locations of points P , X , and Y ? Be prepared to explain or show your reasoning.

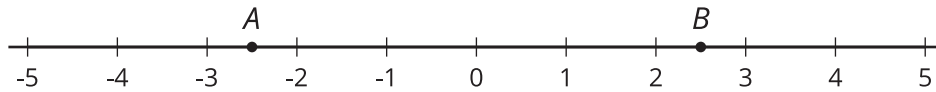


 **Are you ready for more?**

At noon, the temperatures in Portland, Maine, and Phoenix, Arizona, had opposite values. The temperature in Portland was 18°C lower than in Phoenix. What was the temperature in each city? Explain your reasoning.

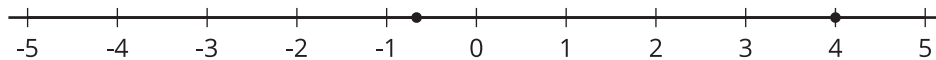
Lesson 2 Summary

Two numbers that are the same distance from 0 and on different sides of the number line are **opposites**. For example, points A and B are opposites because they are both 2.5 units away from 0 and on opposite sides of 0.



We can also say that the opposite of 8.3 is -8.3, and the opposite of $-\frac{3}{2}$ is $\frac{3}{2}$. The opposite of 0 is itself.

Here is another labeled number line with some **rational numbers**. A rational number is a number that can be written as a positive or negative fraction or zero.



The number 4 is positive, and its location is 4 units to the right of 0 on the number line. The number 4 can be written as $\frac{4}{1}$ or $\frac{16}{4}$ or any other equivalent fraction.

The number $-\frac{2}{3}$ is negative, and its location is $\frac{2}{3}$ units to the left of 0 on the number line. To locate $-\frac{2}{3}$ on the number line, we can divide the distance between 0 and -1 into thirds and then count 2 thirds to the left of 0.

All fractions and their opposites are rational numbers.