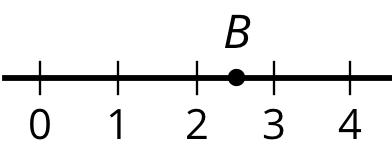
## Lesson 2: Points on the Number Line

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 ?

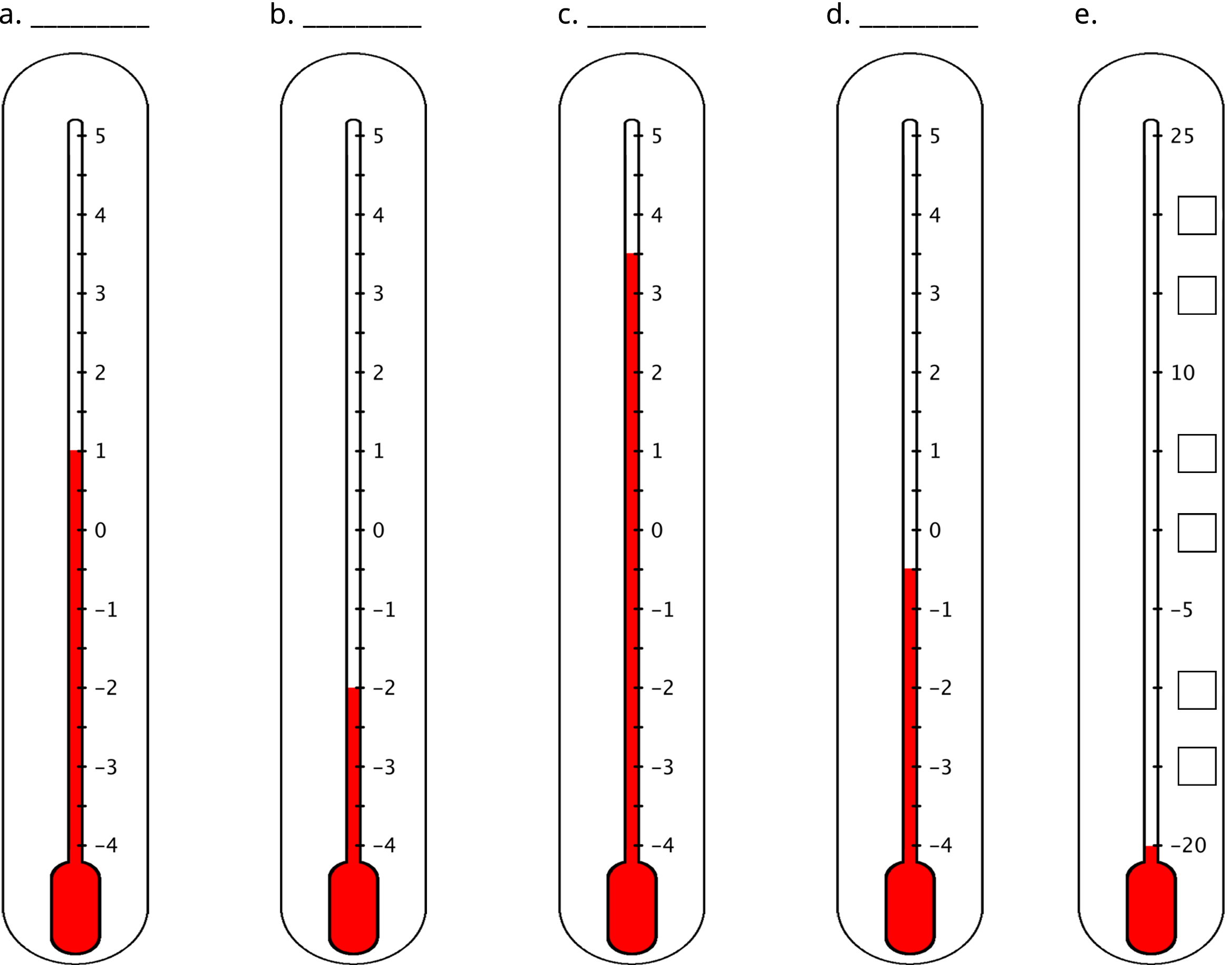


2.5

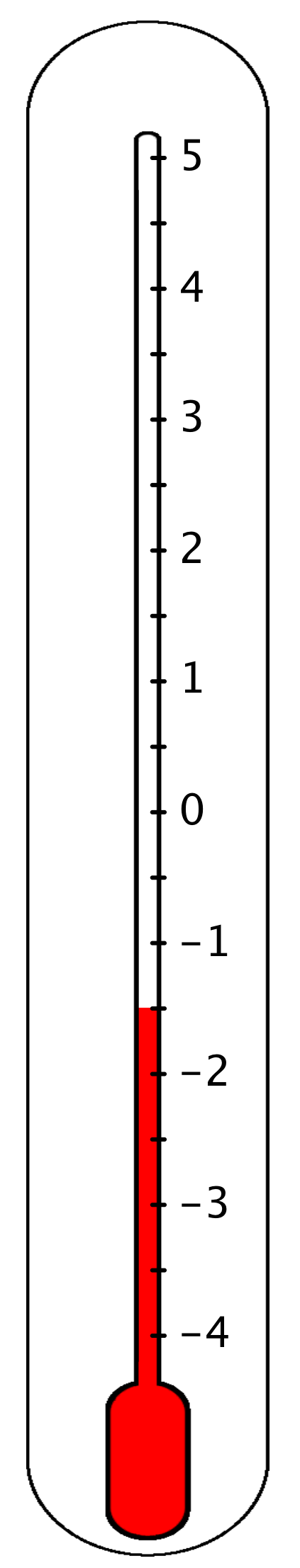
2.49

### 2.2: What’s the Temperature?

1. Here are five thermometers. The first four thermometers show temperatures in Celsius. Write the temperatures in the blanks.

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

1. Elena says that the thermometer shown here reads because the line of the liquid is above . Jada says that it is . Do you agree with either one of them? Explain your reasoning.

* 

1. One morning, the temperature in Phoenix, Arizona, was and the temperature in Portland, Maine, was cooler. What was the temperature in Portland?

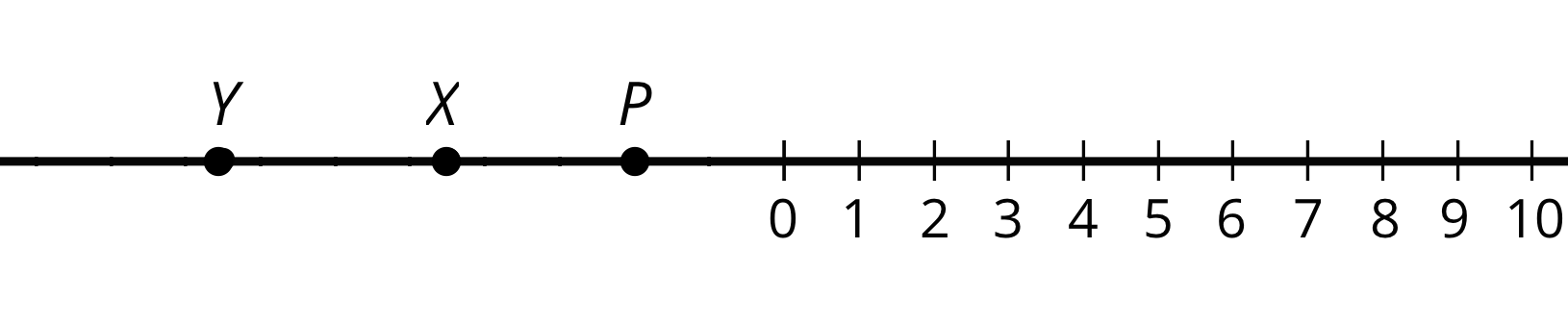
### 2.3: Folded Number Lines

Your teacher will give you a sheet of tracing paper on which to draw a number line.

1. 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.
2. Use your number line to answer these questions:
   1. Which number is the same distance away from zero as is the number 4?
   2. Which number is the same distance away from zero as is the number -7?
   3. Two numbers that are the same distance from zero on the number line are called **opposites**. Find another pair of opposites on the number line.
   4. Determine how far away the number 5 is from 0. Then, choose a positive number and a negative number that is each farther away from zero than is the number 5.
   5. Determine how far away the number -2 is from 0. Then, choose a positive number and a negative number that is each farther away from zero than is the number -2.

* Pause here so your teacher can review your work.

1. Here is a number line with some points labeled with letters. Determine the location of points , , and .

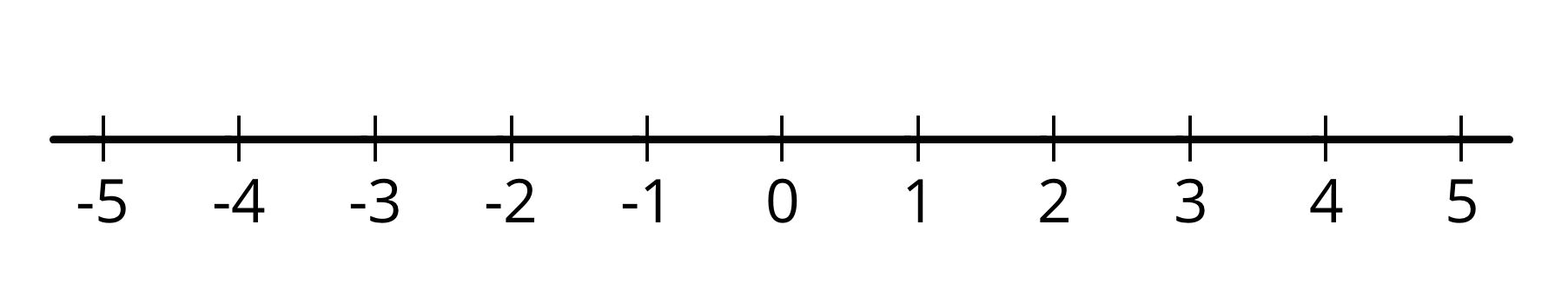
* 
* If you get stuck, trace the number line and points onto a sheet of tracing paper, fold it so that a vertical crease goes through 0, and use the folded number line to help you find the unknown values.

#### Are you ready for more?

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

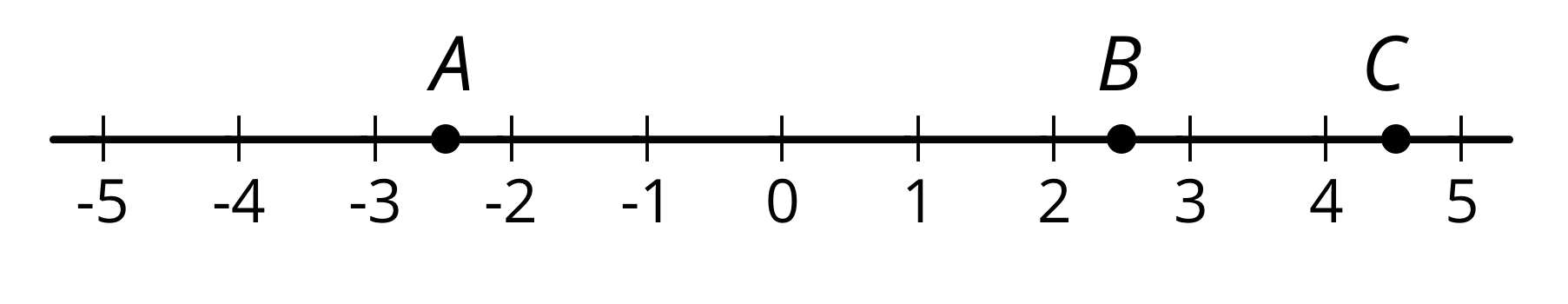
### Lesson 2 Summary

Here is a number line labeled with positive and negative numbers. The number 4 is positive, so its location is 4 units to the right of 0 on the number line. The number -1.1 is negative, so its location is 1.1 units to the left of 0 on the number line.



We say that the *opposite* of 8.3 is -8.3, and that the *opposite* of is . Any pair of numbers that are equally far from 0 are called **opposites**.

Points and are opposites because they are both 2.5 units away from 0, even though is to the left of 0 and is to the right of 0.



A positive number has a negative number for its opposite. A negative number has a positive number for its opposite. The opposite of 0 is itself.

You have worked with positive numbers for many years. All of the positive numbers you have seen—whole and non-whole numbers—can be thought of as fractions and can be located on a the number line.

To locate a non-whole number on a number line, we can divide the distance between two whole numbers into fractional parts and then count the number of parts. For example, 2.7 can be written as . The segment between 2 and 3 can be partitioned into 10 equal parts or 10 tenths. From 2, we can count 7 of the tenths to locate 2.7 on the number line.

All of the fractions and their opposites are what we call**rational numbers**. For example, 4, -1.1, 8.3, -8.3, , and are all rational numbers.



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