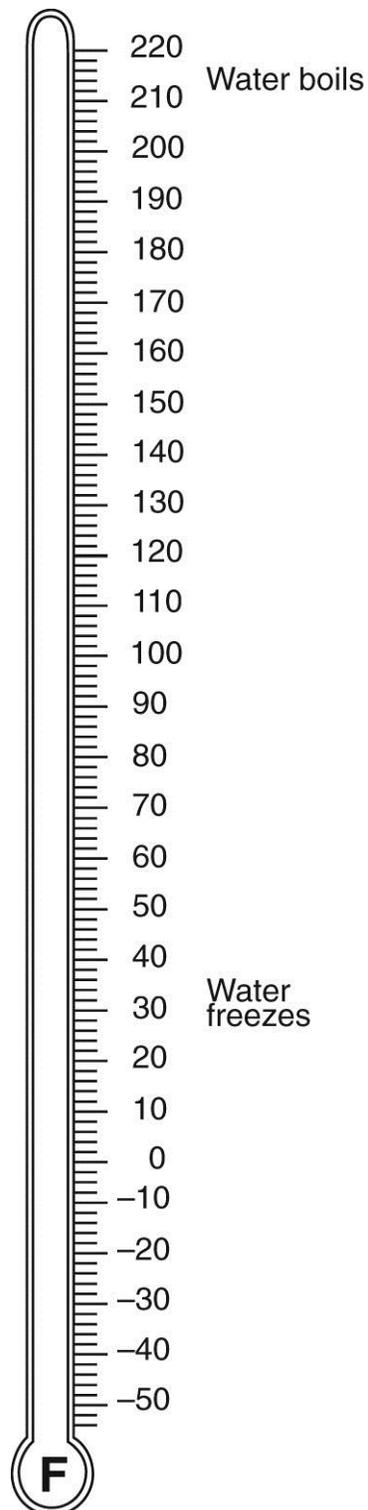


## 9-1 Integers and the Coordinate Plane

### Challenge: Boiling Up and Freezing Down

**Draw a line on the thermometer to show each given temperature record. Then label each state's name at its correct line on the thermometer.**

1. The lowest temperature in California was recorded on January 20, 1937. It was  $-45^{\circ}\text{F}$ .
2. The highest temperature in North Carolina was recorded on August 21, 1983. It was  $110^{\circ}\text{F}$ .
3. The lowest temperature in Georgia was recorded on January 27, 1940. It was  $-17^{\circ}\text{F}$ .
4. The highest temperature in Maine was recorded on July 10, 1911. It was  $105^{\circ}\text{F}$ .
5. The lowest temperature in Missouri was recorded on February 13, 1905. It was  $-40^{\circ}\text{F}$ .
6. The lowest temperature in Texas was recorded on February 8, 1933. It was  $-23^{\circ}\text{F}$ .
7. The highest temperature in Maryland was recorded on July 10, 1936. It was  $109^{\circ}\text{F}$ .
8. The lowest temperature in Massachusetts was recorded on January 12, 1981. It was  $-35^{\circ}\text{F}$ .
9. The highest temperature in Oklahoma was recorded on June 27, 1994. It was  $120^{\circ}\text{F}$ .
10. The highest temperature in Mississippi was recorded on July 29, 1930. It was  $115^{\circ}\text{F}$ .



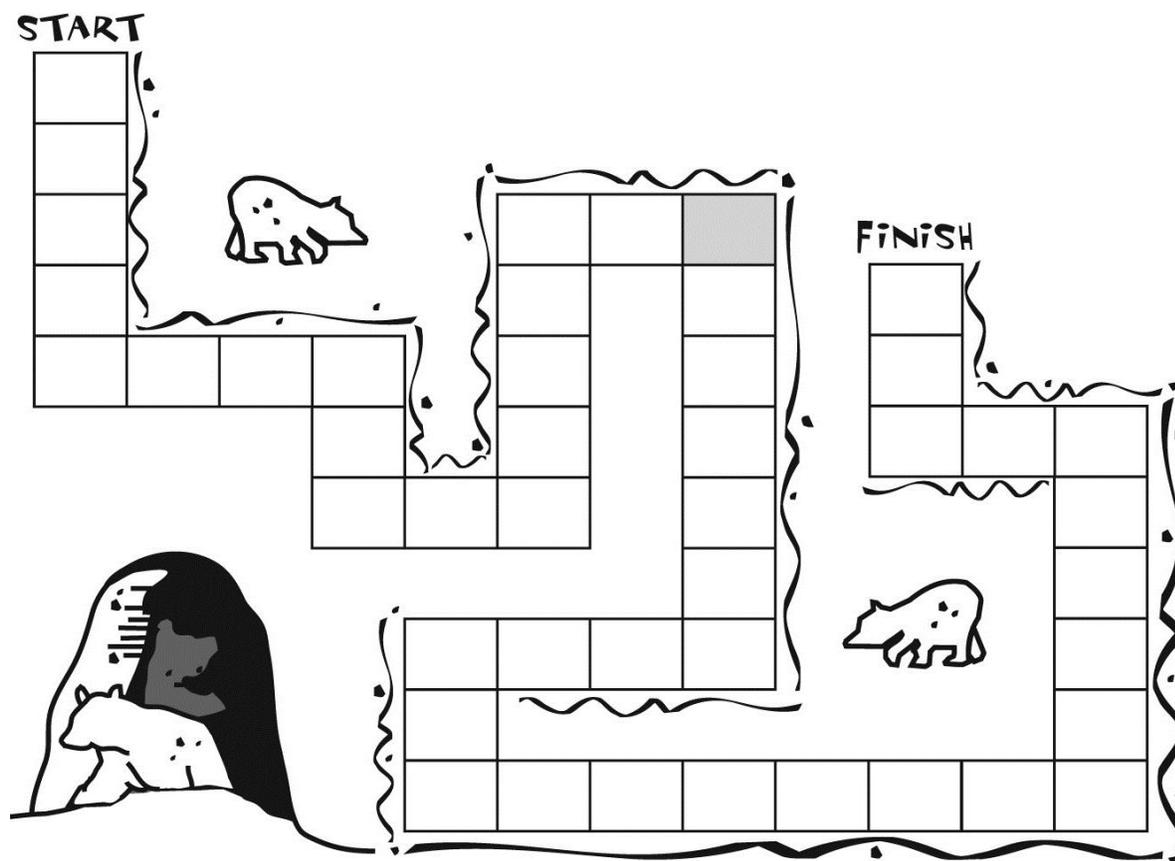
## 9-2 Integers and the Coordinate Plane

### Challenge: Integer Maze

During winter, bears and many other animals hibernate, or go into a sleeplike state. When they do so, their body temperatures greatly decrease. How much can their temperatures change during hibernation?

Write the following integers along the maze so they are increasing from start to finish. The shaded box in the maze will have the answer to the question.

5, -14, -39, -3, 61, -60, -23, -72, -48, -11, 100, -45, 10, -57, -1, -29, -64, -37, 0, -65, 74, 98, -28, -7, -63, -49, -21, -54, 27, 53, -9, -32, -16, 35, -30, -18, -52, 86, -46, 42, -56, -41, -22, -43, 19

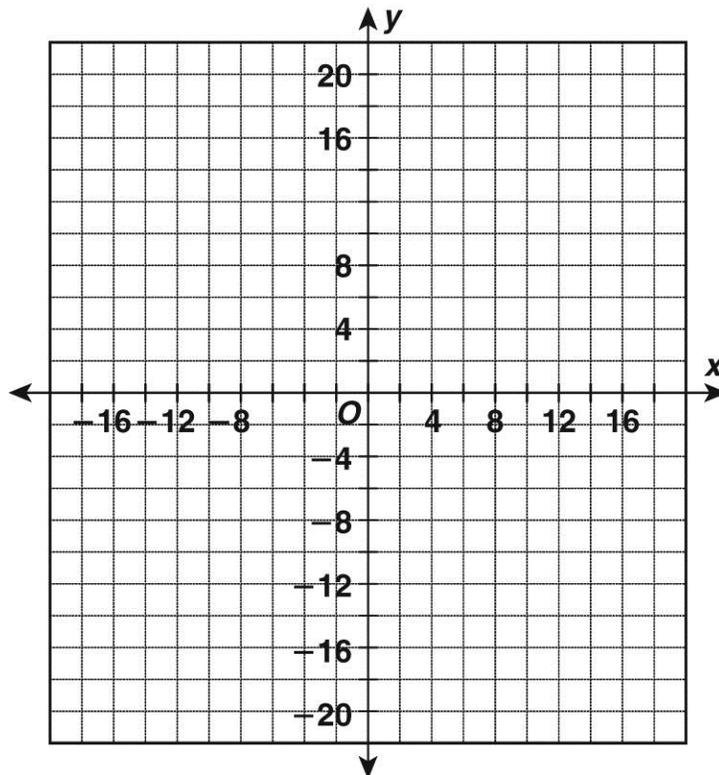


## 9-3 Integers and the Coordinate Plane

### Challenge: Plot and See

**Graph each point below in the order given. Connect the points as you graph them to see a creature that lives most of its life 50 feet below sea level, or at  $-50$  feet.**

**START:**  $(0, 20)$ ,  $(1, 19)$ ,  $(3, 18)$ ,  $(5, 15)$ ,  $(6, 15)$ ,  $(6, 12)$ ,  $(10, 8)$ ,  $(12, 8)$ ,  $(11, 6)$ ,  $(9, 6)$ ,  
 $(9, 7)$ ,  $(3, 11)$ ,  $(0, 11)$ ,  $(-2, 12)$ ,  $(3, 4)$ ,  $(2, 1)$ ,  $(3, -4)$ ,  $(-1, -13)$ ,  $(0, -17)$ ,  $(4, -18)$ ,  
 $(7, -17)$ ,  $(7, -16)$ ,  $(5, -16)$ ,  $(6, -14)$ ,  $(8, -15)$ ,  $(9, -18)$ ,  $(6, -20)$ ,  $(3, -20)$ ,  $(-3, -18)$ ,  
 $(-4, -13)$ ,  $(-2, -4)$ ,  $(-3, -1)$ ,  $(-4, -2)$ ,  $(-6, 2)$ ,  $(-5, 5)$ ,  $(-10, 12)$ ,  $(-6, 18)$ ,  $(0, 20)$  **STOP!**

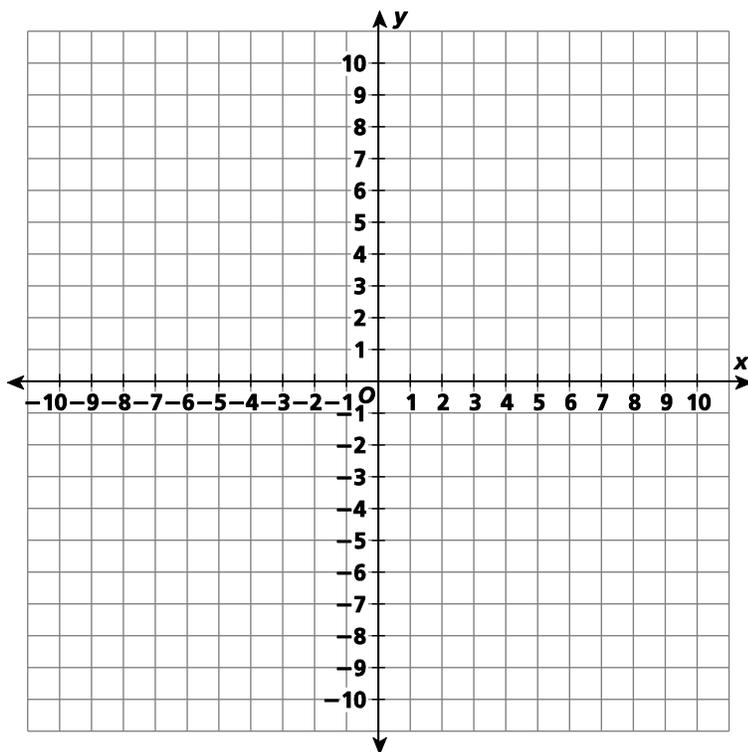
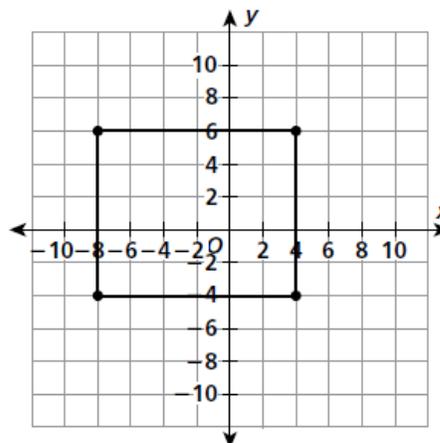


## 9-4 Integers and the Coordinate Plane

### Challenge: Polygons in the Coordinate Plane

Charis is planning to have a new deck built on the back of her house. The coordinate plane shows plans for the deck in feet.

The builder that Charis hired thought there might be a better design for the deck with the same perimeter. Use the grid to draw 3 different rectangular decks with the same perimeter as Charis' original design.



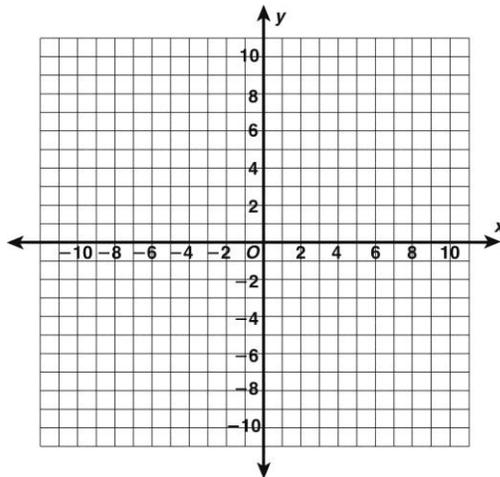
If the builder charges Charis per square foot, which design will cost Charis the least to build? Explain your answer.

## 9-5 Integers and the Coordinate Plane

### Challenge: Transformations as Mappings

Transformations can be described using mathematical symbols. As you move forward through mathematics, you will learn about something called a “mapping”.

Transformations are really “mappings” from the  $x$ - $y$  plane onto itself. While you don’t need to worry about all of this vocabulary just yet, the following problems are related to mappings. If you can solve these exercises, you are well on your way to higher-level mathematics!



1. Begin by drawing square  $EFGH$  located at  $(-10, 2)$ ,  $(-10, 8)$ ,  $(-4, 8)$ , and  $(-4, 2)$ .
2. Translate  $EFGH$  12 units right and 2 units down. Rename to  $E'F'G'H'$ . Can you come up with a mathematical way to describe what happened to the points of  $EFGH$  under this translation?

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3. Reflect  $E'F'G'H'$  across the  $x$ -axis. Rename to  $E''F''G''H''$ . Can you come up with a mathematical way to describe what happened to the points of  $E'F'G'H'$  under this reflection?

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4. Rotate  $E''F''G''H''$   $270^\circ$  about point  $F''$ . Can you name another transformation that would have been equivalent to this rotation?

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