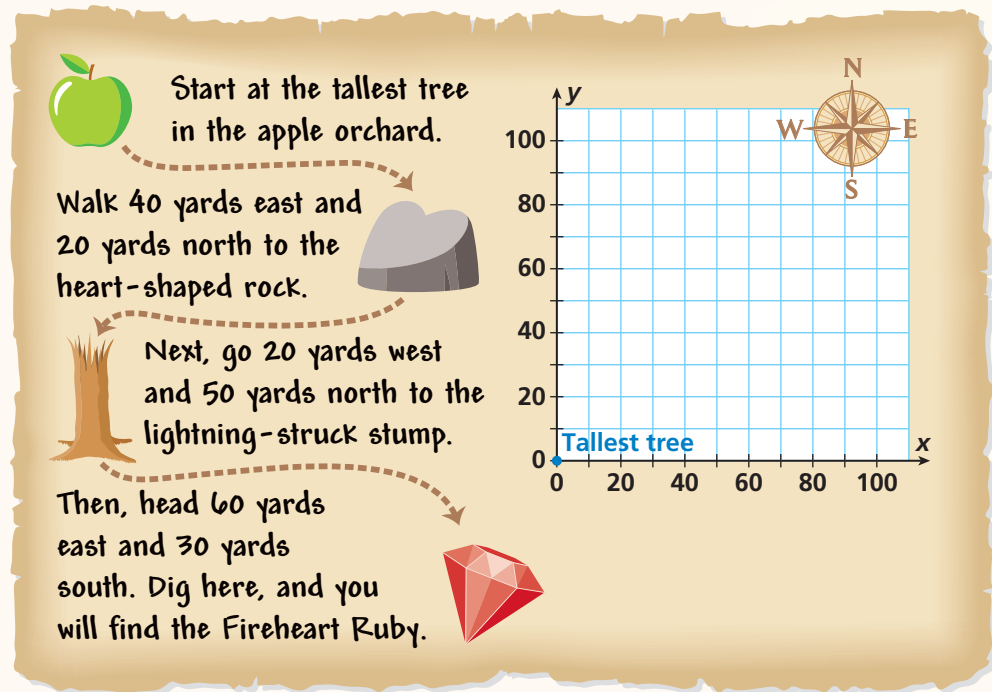# Integer Concepts

CAN YOU FIND THE TREASURE?

Read and follow the set of directions.

You are searching for the Fireheart Ruby. Locate the points that represent the heart-shaped rock, the lightning-struck stump, and the Fireheart Ruby on the coordinate grid. The units on the grid are in yards, and the tallest tree in the apple orchard is at the origin.

Start at the tallest tree in the apple orchard.

Walk 40 yards east and 20 yards north to the heart-shaped rock.

Next, go 20 yards west and 50 yards north to the lightning-struck stump.

Then, head 60 yards east and 30 yards south. Dig here, and you will find the Fireheart Ruby.

Tallest tree

Turn and Talk

- What ordered pair represents the location of the Fireheart Ruby? Justify your response.

- Describe a more direct route from the tallest tree in the apple orchard to the ruby. Explain how you know that your route is shorter than the route in the set of directions.
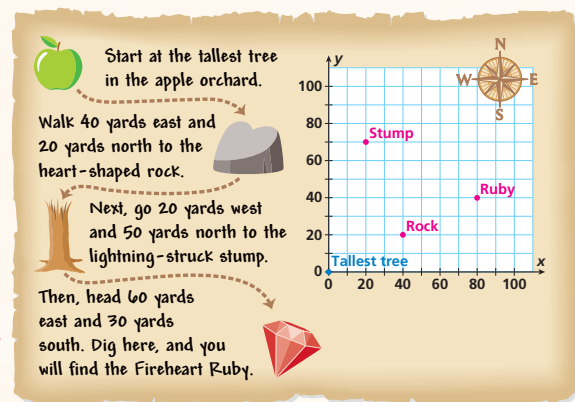
Integer Concepts

CAN YOU FIND THE TREASURE?

Bullet 1: (80, 40); Possible answer: The stump is located at (20, 70). 60 yards east of 20 is 80. Then 30 yards south is 40.

Bullet 2: Possible answer: From the tallest tree, walk 80 yards east and 40 yards north. My route requires walking 120 yards. The route in the directions requires walking 60 yards, then 70 yards, and then 90 yards, for a total of 220 yards.

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Turn and Talk

- What ordered pair represents the location of the Fireheart Ruby? Justify your response.
- Describe a more direct route from the tallest tree in the apple orchard to the ruby. Explain how you know that your route is shorter than the route in the set of directions.

COMMON ERRORS

Students may start in the wrong location or move in the wrong direction when plotting points.

Watch for students who start from the origin when plotting the locations of the stump and the ruby. For these students, ask:

- If you were following the directions, what would you do next after you found the heart-shaped rock? Would it make sense to go back to the tallest tree in the orchard? Why or why not?

Watch for students who state that the ruby is located at (40, 80). This is evidence that students may not know which coordinate comes first in an ordered pair. For these students, ask:

- What does the first coordinate in an ordered pair tell you about a point's location? What does the second coordinate tell you?

CAN YOU FIND THE TREASURE?

Engage Students

Have students work in mixed-ability groups to complete the task. This task is designed to:

- activate prior knowledge that is essential for success in the upcoming module.
- challenge students to think critically and justify their reasoning.
- encourage cooperation, collaboration, and discourse within a group.

Guide Student Discussion

Listen for students who correctly use vocabulary as part of their discourse. Ask students to explain what they mean if they use those terms.

Q **What ordered pair describes the location of the tallest tree in the apple orchard?** (0, 0)

Q **How can you model moving east on the coordinate grid? How can you model moving north?** Possible answer: To model moving east, move to the right on the coordinate grid, increasing the x-coordinate; to model moving north, move up on the coordinate grid, increasing the y-coordinate.

Q **After you have plotted a point for the heart-shaped rock, how can you find the location of the lightning-struck stump?** Move 20 units to the left and 50 units up.

Extend the Task

- Have students write a set of directions that would lead a person from the ruby to the stump, to the rock, and then back to the tallest tree.
- Have students make their own set of directions to a different treasure. Students can trade their directions with a partner and determine the ordered pair that represents the location of their partner's treasure.