Applications Connections Extensions ACE

Applications

For Exercises 1–7, use the map of Euclid from Problem 1.1.

1. Give the coordinates of each landmark.

a. art museum **b.** hospital **c.** greenhouse

2. What is the shortest driving distance from the animal shelter to the stadium?

3. What is the shortest driving distance from the hospital to the gas station?

4. What are the coordinates of a point halfway from City Hall to the hospital if you travel by taxi? Is there more than one possibility? Explain.

5. What are the coordinates of a point halfway from City Hall to the hospital if you travel by helicopter? Is there more than one possibility? Explain.

6. **a.** Which landmarks are 7 blocks from City Hall by car?

b. Give precise driving directions from City Hall to each landmark you listed in part (a).

7. Euclid Middle School is located at the intersection of two streets. The school is the same driving distance from the gas station as the hospital is from the greenhouse.

a. List the coordinates of each place on the map where the school might be located.

b. Find the flying distance, in blocks, from the gas station to each location you listed in part (a).

The points (0, 0) and (3, 2) are two vertices of a polygon with integer coordinates.

Homework Help Online PHSchool.com
For: Help with Exercise 8
Web Code: ape-2108

8. What could the other two vertices be if the polygon is a square?

9. Suppose the polygon is a nonrectangular parallelogram. What could the other two vertices be?

10. What could the other vertex be if the polygon is a right triangle?

The points (3, 3) and (2, 6) are two vertices of a right triangle. Use this information for Exercises 11–13.

11. **Multiple Choice** Which point could be the third vertex of the right triangle?

A. (3, 2) **B.** (−1, 5) **C.** (7, 4) **D.** (0, 3)

12. Give the coordinates of at least two other points that could be the third vertex.

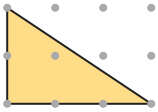
13. How many right triangles with vertices (3, 3) and (2, 6) can you draw? Explain.

14. Can the following points be connected to form a parallelogram? Explain.

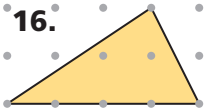
(1, 1) (2, −2) (4, 2) (3, 5)

Find the area of each triangle. Copy the triangles onto dot paper if you need to.

15.



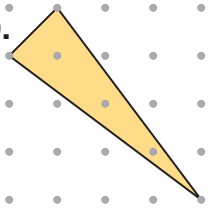
16.



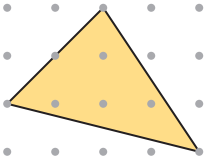
17.

18.

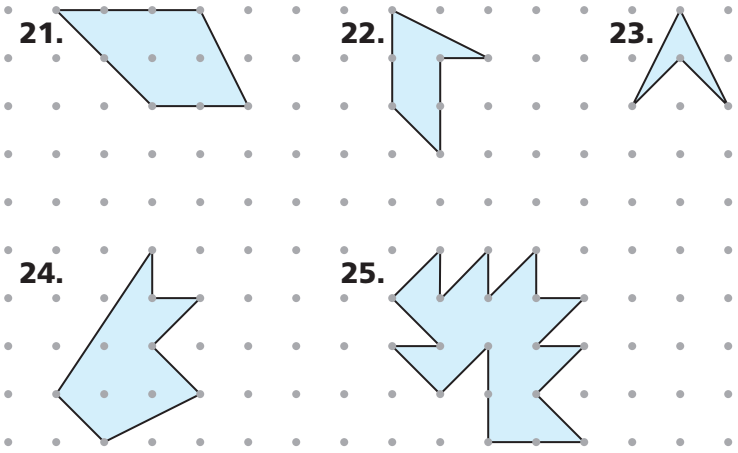
19.



20.



Find the area of each figure, and describe the method you use. Copy the figures onto dot paper if you need to.



Connections

In the city of Euclid, the length of each block is 150 meters. Use this information and the map from Problem 1.1 for Exercises 26–28.

26. What is the shortest driving distance, in meters, from City Hall to the animal shelter?

27. What is the shortest driving distance, in meters, from the police station to the gas station?

28. Between which two landmarks is the shortest driving distance 750 meters?

29. When she solved Problem 1.2, Fabiola used slopes to help explain her answers.

a. In Question A, she used slopes to show that adjacent sides of the figure were perpendicular. How might she have done this?

b. In Question D, she used slopes to show that the figure was a parallelogram. How might she have done this?

30. Refer to the map of Euclid from Problem 1.1.

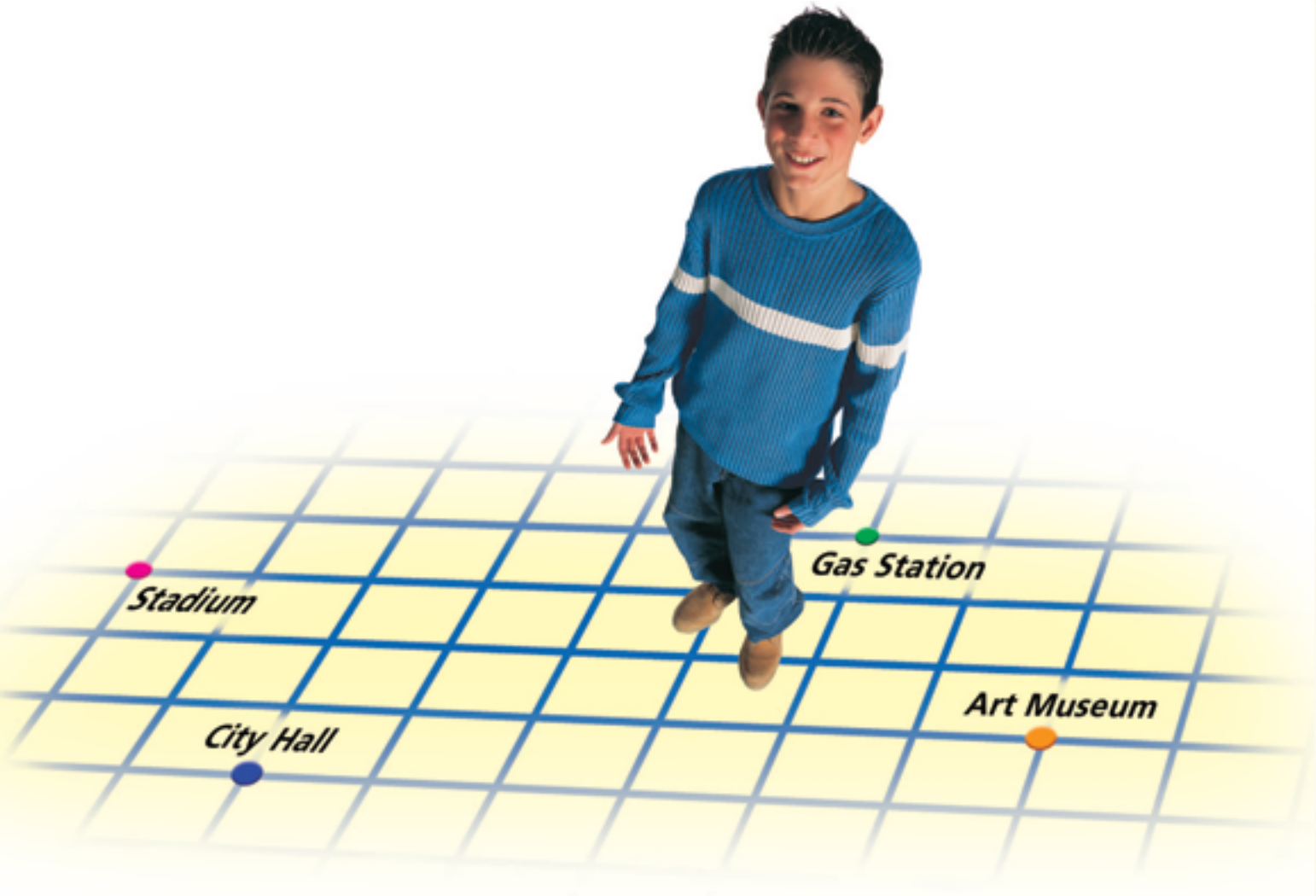
a. Matsu walks 2 blocks west from the police station and then walks 3 blocks north. Give the coordinates of the place where he stops.

b. Matsu's friend Cassandra is at City Hall. She wants to meet Matsu at his ending location from part (a). What is the shortest route she can take if she walks along city streets? Is there more than one possible shortest route?

c. Lei leaves the stadium and walks 3 blocks east, then 3 blocks south, then 2 blocks west, and finally 4 blocks north. Give the coordinates of the place where she stops.

d. Lei's sister Aida wants to meet her at her ending location from part (c). Aida is now at City Hall. What is the shortest route she can take if she walks along city streets? Is there more than one possible shortest route?

e. In general, how can you find the shortest route, walking along city streets, from City Hall to any point in Euclid?



31. Below are equations for eight lines.

line 1: $y = 3x + 5$ line 2: $y = 0.5x + 3$
line 3: $y = 10 - 2x$ line 4: $y = 1 - \frac{1}{3}x$
line 5: $y = 7 + 3x$ line 6: $y = -2x + 1$
line 7: $y = 5 + 6x$ line 8: $y = 3x$

a. Which of the lines are parallel to each other?

b. Which of the lines are perpendicular to each other?

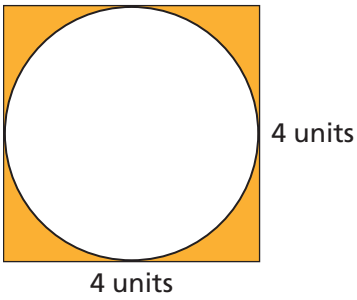
Go Online PHSchool.com
For: Multiple-Choice Skills Practice
Web Code: apa-2154

32. Marcia finds the area of a figure on dot paper by dividing it into smaller shapes. She finds the area of each smaller shape and writes the sum of the areas as $\frac{1}{2} \cdot 3 + \frac{1}{2} + \frac{1}{2} + 1$.

a. What is the total area of the figure?

b. On dot paper, draw a figure Marcia might have been looking at.

33. In the figure, a circle is inscribed in a square.



a. Find the area of the circle.

b. Find the area of the shaded region.

34. Refer to the ordered pairs to answer the questions. Do *not* plot the points on a grid. Explain each answer.

$(2, -3)$	$(3, -4)$	$(-4, -5)$	$(4, 5)$
$(-4, 6)$	$(-5, -5)$	$(0, -6)$	$(6, 0)$

a. Which point is farthest right?

b. Which point is farthest left?

c. Which point is above the others?

d. Which point is below the others?

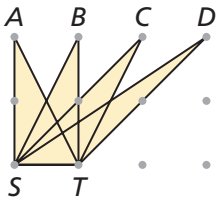
Extensions

35. Find a road map of your city or county. Figure out how to use the map's index to locate a city, street, or other landmark. How is finding a landmark by using an index description similar to and different from finding a landmark in Euclid by using its coordinates?

36. Use a map of your state to plan an airplane trip from your city or town to four other locations in your state. Write a set of directions for your trip that you could give to the pilot.

37. On grid paper, draw several parallelograms with diagonals that are perpendicular to each other. What do you observe about these parallelograms?

38. Find the areas of triangles *AST, BST, CST,* and *DST*. How do the areas compare? Why do you think this is true?



39. Find the areas of triangles *VMN, WMN, XMN, YMN,* and *ZMN*. How do the areas compare? Why do you think this is true?