

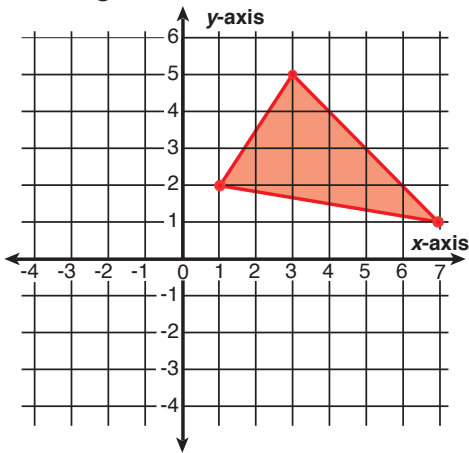
Student Guide

Plotting and Describing Shapes

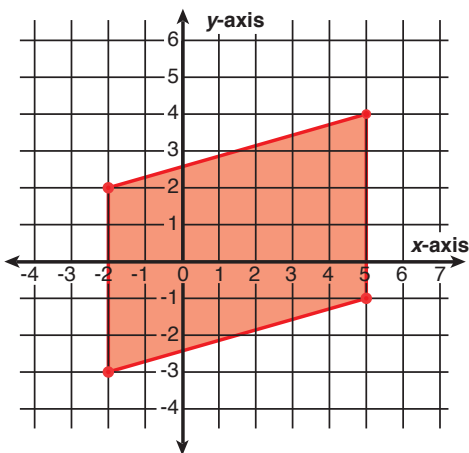
(SG pp. 277–280)

Questions 1–20

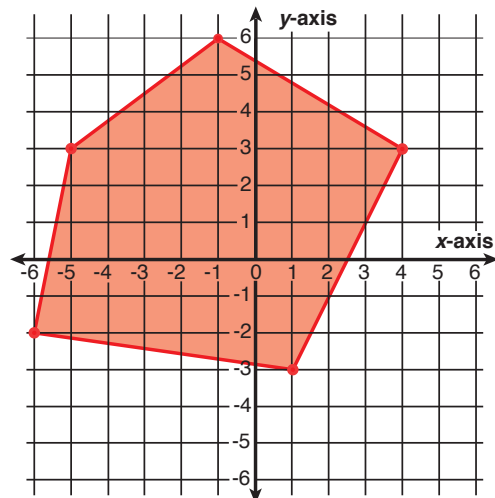
1.* Triangle



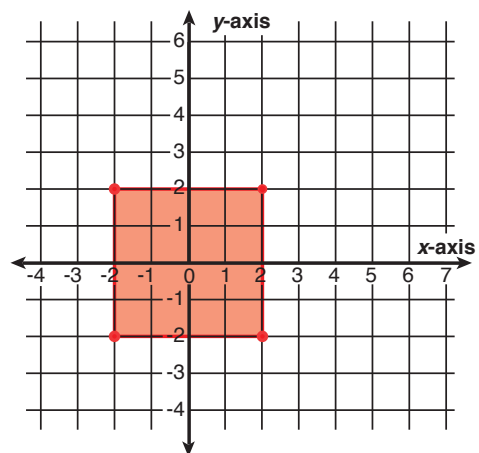
2.* Parallelogram or quadrilateral



3.* Pentagon

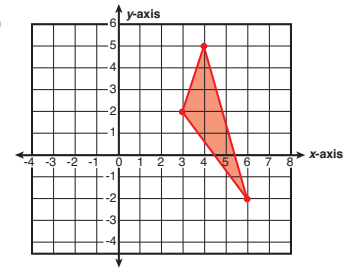


4.* Square



*Answers and/or discussion are included in the lesson.

Then José connected the points in the order in which they were given. He connected the last point to the first point.



On Four-Quadrant Grid Paper, fill the following shape orders. Make sure you connect the points in order. Connect the last dot to the first dot. Then describe the shape you made.

1. (1, 2), (3, 5), (7, 1)
2. (-2, -3), (-2, 2), (5, 4), (5, -1)
3. (-1, 6), (4, 3), (1, -3), (-6, -2), (-5, 3)
4. (-2, -2), (-2, 2), (2, 2), (2, -2)
5. Name the shape you drew in Questions 1–4.

José was given the title of Master Shape Maker. José gets many difficult projects. See if you can make the shape for this problem and become José's assistant. Use a sheet of Half-Centimeter Grid Paper as the first quadrant. Place (0, 0) in the lower left corner and label the axes.

6. A. (7, 11), (7, 18), (8, 20), (8, 23), (10, 26), (14, 23), (20, 22), (23, 24), (24, 22), (24, 19), (25, 18), (25, 14), (24, 9), (22, 7), (12, 7)

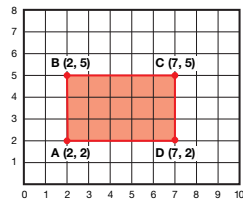
Draw these decorations on the shape you made in Question 6A.

- B. Decoration 1: (10, 20), (12, 18), (14, 20)
- C. Decoration 2: (17, 20), (19, 19), (21, 20)
- D. Decoration 3: (16, 17), (15, 16), (16, 14)

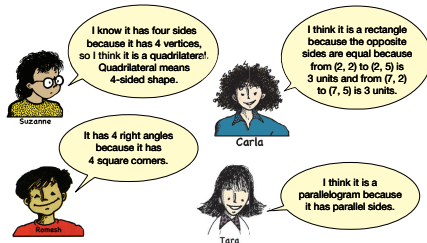
7. Draw a shape on Half-Centimeter Grid Paper whose vertices are ordered pairs. Label the points with the ordered pairs. Then write down the ordered pairs in order on another sheet of paper. Give the coordinates to a friend and see if he or she can graph your shape.

Describing Shapes

8. Mr. Moreno drew this mystery shape. Describe the properties of the shape.



9. Several students described the properties of the shape as well.

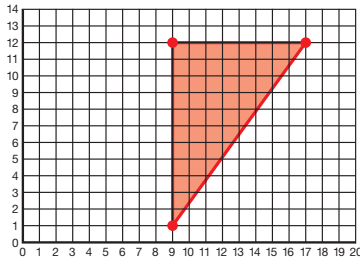


Which students do you agree with? Why or why not?

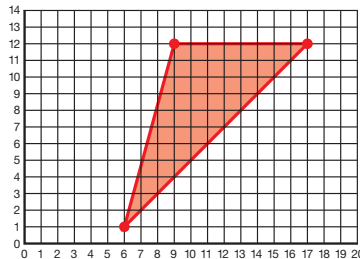
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- 5.* See answers to Questions 1–4.
- 6.* See Figure 1 in the lesson.
- 7.* Answers will vary.
- 8. Possible response: The shape is a quadrilateral that has two sets of parallel sides, four right angles, and opposite sides are congruent. Adjacent sides are not congruent.
- 9. Possible response: I agree with Suzanne and Romesh because the shape has four sides and four angles and is a quadrilateral. I also agree with Carla because opposite sides are congruent. I also agree with Tara because the shape does have two sets of parallel sides.

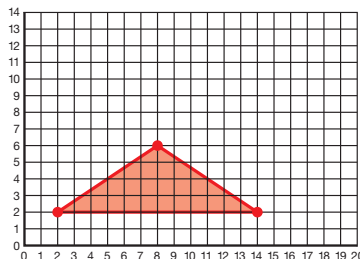
10. See the *Shape Sort Cards* Masters for plotted shapes.
11. **A.*** Triangles with right angles:
Shapes 1, 2, and 6
- B.*** Triangles without right angles:
Shapes 3, 4, 5, 7, and 8
- C.** Right triangles
- D.*** Possible response: the numbers in the sets of ordered pairs share the same numbers so the sides of the triangle can follow the grid of the coordinate map.
- E.*** Possible response: I disagree with Mark. Angle G is not a right angle. It is a little larger than a right angle. So this triangle is not a right triangle.
12. Possible response: (9, 1) (9, 12) (17, 12)



13. Possible response: (6, 1) (9, 12) (17, 12)



14. **A.** triangle with congruent sides: Shapes 5, 7
triangles without congruent sides: Shapes 1, 2, 3, 4, 6, and 8
- B.** Possible response: I measured the sides and they were the congruent.
- C.** Possible response: (2, 2) (8, 6) (14, 2)



Triangles

10. Use the *Shape Sort Cards: Triangles* pages in the *Student Activity Book* to make shapes with ordered pairs.

11. Cut apart the cards from the *Sort Cards: Triangles* pages. Sort the triangles into two groups: triangles with right angles and triangles without right angles.

- Which triangles have right angles?
- Which triangles do not have right angles?
- What name do we give to triangles that have right angles?
- What do you notice about the coordinates of the right triangles?
- Mark said, I think the shape on card 3 is a right triangle. Do you agree with Mark? Why or why not?

12. Draw a different right triangle on one of the cards on the *Blank Sort Cards* pages in the *Student Activity Book*. List the coordinates and label the vertices.

13. Draw an obtuse triangle on one of the cards on the *Blank Sort Cards* pages. List the coordinates and label the vertices.

14. **A.** Sort the triangles into two groups again: this time triangles with at least one set of congruent or equal sides in one pile, and triangles without congruent sides in another pile.

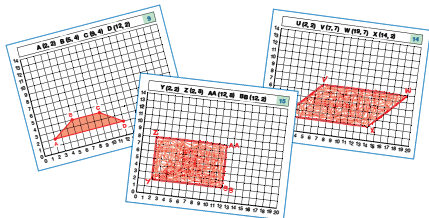
- Show or tell your neighbor how you decided which shapes have congruent sides.
- Draw a triangle with at least two congruent sides on one of the cards on the *Blank Sort Cards* pages. List the coordinates and label the vertices.

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Quadrilaterals

15. Use the *Shape Sort Cards: Quadrilaterals* pages in the *Student Activity Book* to make shapes with ordered pairs.



16. Cut apart the cards from the *Sort Cards: Quadrilaterals* pages. Sort the quadrilaterals into two groups: shapes with right angles and shapes without right angles.

- A. Which quadrilaterals have at least one right angle?
- B. Which quadrilaterals do not have right angles?
- C. What do you notice about the coordinates of the shapes that have right angles?

17. Draw a different quadrilateral on one of the cards on the *Blank Sort Cards* pages in the *Student Activity Book*. List the coordinates and label the vertices.

18. Look at the shapes that have right angles. Sort these shapes into 2 piles. What property did you use to sort the shapes?

19. Look at the shapes that do not have right angles. Sort these shapes into 2 piles. What property did you use to sort the shapes?

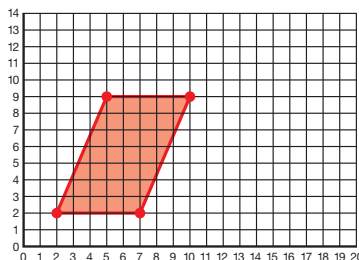
20. Plot each shape on one of the cards on the *Blank Sort Cards* pages. What are the properties of each shape?

- A. (2, 2), (11, 0), (19, 6), (8, 10)
- B. (2, 5), (4, 2), (19, 6), (4, 8)

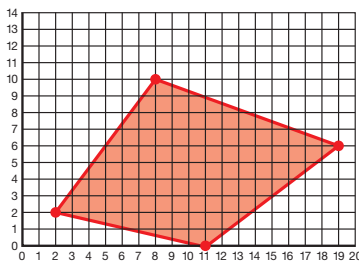
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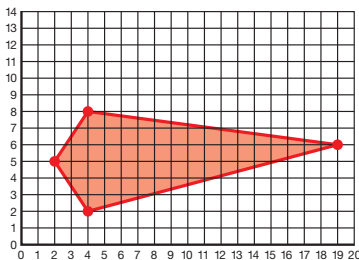
15. See the *Shape Sort Cards Masters* for plotted shapes.
16. **A*** Quadrilaterals with at least one right angle:
Shapes 10, 12, 13, 15, 16, 19
- B.** Quadrilaterals with no right angles:
Shapes 9, 11, 14, 17, 18, 20
- C*** Possible response: the numbers in the sets of ordered pairs share the same numbers so the sides of the quadrilateral can follow the grid of the coordinate map.
17. Possible response: (2, 2) (5, 9) (10, 9) (7, 2)



- 18.* Possible response: Shapes that have 2 right angles: Shape 13, 16, 19
Shapes that have more than 2 right triangles: Shape 10, 12, 15
- 19.* Possible response: Shapes that have only one set of parallel sides: Shape 9, 18
Shapes that have 2 sets of parallel sides: Shape 11, 14, 17, 20
20. **A*** This shape is a quadrilateral.



B* This shape is a quadrilateral and a kite.



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*Answers and/or discussion are included in the lesson.

Homework (SG p. 281)

Questions 1–10

1. Answers will vary. One possible set of coordinates might be: (2, 2) (–6, 2).
2. Answers will vary: One possible set of coordinates for a larger rectangle might be: (2, 6) (–6, 6)
3. (1, 6)
4. Possible response: I do not agree with Luis. A parallelogram has two pair of parallel sides just like a rectangle. However, a rectangle must have 4 right angles and parallelograms don't necessarily have to have right angles. A parallelogram is only a rectangle if it has right angles. The coordinates that are given already do not form a right angle so this shape cannot be a rectangle.
5. Possible response: I think the shape will be a rectangle. The ordered pairs have the same numbers and probably form right angles. The distance between the coordinates seems about the same too.
6. Possible response: I do think the shape will be a trapezoid. One set of ordered pairs seems to make a line shorter than the other and there are also seems to be two lines the same distance apart, which makes them parallel.
7. Possible response: I agree with Tanya. The coordinates make a three-sided shape, which is a triangle.
8. **A.** Possible response: (6, 6), (6, 0).
To make a square, coordinates need to be 6 units apart since (0, 0) and (0, 6) are 6 units apart and squares have 4 equal sides.
- B.** (–6, 0), (–6, 6)
9. **A.** Luis's coordinates make a rectangle;
Possible response: I plotted the shape and it is a rectangle: 4 sides and 4 right angles and adjacent sides are different lengths.
- B.** Julia's shape is a trapezoid.
10. This shape is a right triangle.

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Use Four-Quadrant Grid Paper to answer the following questions.

1. Two of the vertices of Rectangle A are located at (–6, –1) and (2, –1). List 2 other sets of coordinates to make Rectangle A.
2. Make a rectangle larger than Rectangle A. (–6, 1) and (2, 1) are two vertices. List the coordinates for the other two vertices.
3. Below are the coordinates for the vertices of a quadrilateral. List the coordinate for the missing vertex if the quadrilateral is a parallelogram. Justify your decision. (3, 4), (6, 4), (4, 6)
4. Luis said, "I can make a rectangle by adding one set of coordinates to (3, 4), (6, 4) and (4, 6)." Do you agree with Luis? Why or why not?
5. Look at the coordinates listed. Without plotting, predict the shape. Explain your thinking.
A (–5, 10), B (–5, 6), C (–1, 6), D (–1, 10)
6. Mark told the class he made a trapezoid with these coordinates:
A (2, –4), B (4, –2), C (6, –2), D (7, –4).
Do you agree with Mark? Why or why not?
7. Tanya wrote down these coordinates and said they mark the vertices of a triangle.
A (–1, 3), B (–4, 4), C (–4, 0)
Do you agree with Tanya? Why or why not?

✓ **Check-In: Questions 8–10**

8. Two of the vertices of Square B are located at (0, 0) and (0, 6).
A. List the coordinates for the other two vertices needed to make Square B.
B. Is there another way to make Square B? List the coordinates for the other two vertices.
9. Julia and Luis recorded coordinates for the vertices of polygons.
Julia: A (1, 8), B (3, 6), C (7, 10), D (3, 10)
Luis: A (1, 1), B (1, 4), C (6, 4), D (6, 1)
A. Which coordinates make a rectangle? How do you know?
B. What shape does the other set of coordinates make?
10. Describe the triangle with vertices located at A (2, 2), B (2, 5) C (7, 2).

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