





Shapes to learn the properties of:

- 1.) right 
- 2.) isosceles 
- 3.) equilateral 
- 4.) scalene 



Name: _____



In Top Shape

Polygons such as triangles and quadrilaterals can be classified by different properties—by the lengths of their sides, the relationship between their sides, and the measures of their angles.

Properties

- a. two pairs of opposite sides that are parallel
- b. all angles congruent
- c. at least one pair of perpendicular sides
- d. a pair of consecutive congruent sides
- e. no two sides with the same measure

1. Cut out the shape names located at the end of the lesson. Sort the shapes based on the property assigned to you. Record the property and the names of the shapes that are characterized by the property.




- 5.) trapezoid 
- 6.) parallelogram 

2. Select a different property from the given list. Sort the shapes based on a combination of the two properties. Record the properties and the names of the shapes that are characterized by them.

Remember:

A trapezoid has at least one pair of parallel sides.

3. Compare your sorts with your classmates' sorts. Analyze how different combinations of properties characterized different shapes.

- 7.) rectangle 
- 8.) rhombus 
- 9.) square 



4. Determine whether each statement is always, sometimes, or never true. Explain your reasoning.

a. A rectangle is a parallelogram.

b. A rhombus is a square.

c. A scalene triangle is a right triangle.

d. A parallelogram is a trapezoid.

e. A right triangle is an equilateral triangle.

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ACTIVITY

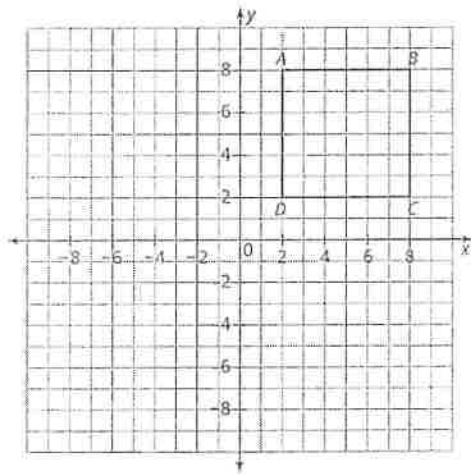
1.1

Calculating Distance on the Coordinate Plane



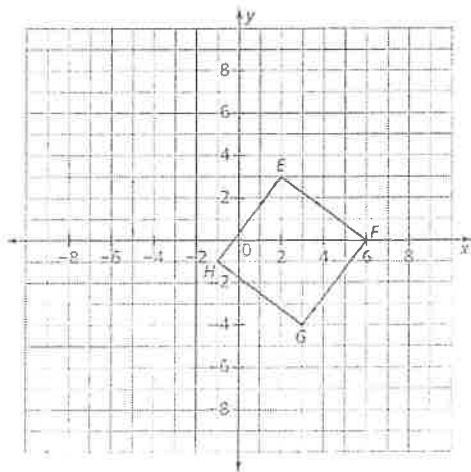
Let's analyze quadrilaterals that lie on a coordinate plane and classify them by their properties.

Consider quadrilateral $ABCD$ shown.



1. Classify the quadrilateral. Justify your reasoning.

Now consider quadrilateral $EFGH$ shown.



2. Determine whether quadrilateral $EFGH$ can be classified as a parallelogram. Justify your reasoning.
3. Determine whether quadrilateral $EFGH$ can be classified as a rectangle. Justify your reasoning.

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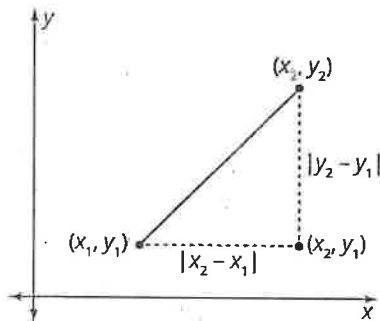


4. What information do you need to classify quadrilateral $EFGH$ as a square?

5. On quadrilateral $EFGH$, draw a right triangle EFR such that \overline{EF} is the hypotenuse. Use the Pythagorean Theorem to determine the length of \overline{EF} .

You used the Pythagorean Theorem to calculate the distance between two points on the coordinate plane. Your method can be written as the *Distance Formula*. The **Distance Formula** states that if (x_1, y_1) and (x_2, y_2) are two points on the coordinate plane, then the distance d between (x_1, y_1) and (x_2, y_2) is calculated using the formula given.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



The absolute value symbols are used because the difference represents a distance.

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6. When you use the Distance Formula, does it matter which point you identify as (x_1, y_1) and which point you identify as (x_2, y_2) ? Explain your reasoning.

7. Can quadrilateral $EFGH$ be classified as a square? Justify your reasoning.

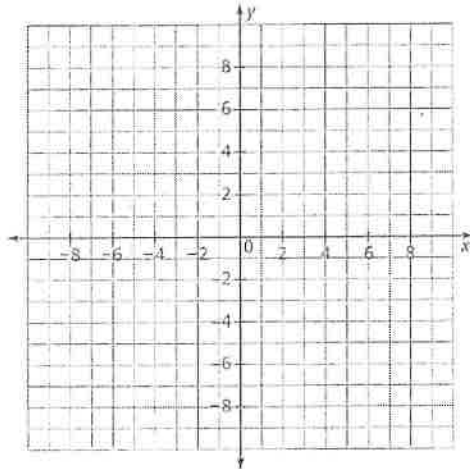
ACTIVITY

1.4

Classifying a Quadrilateral on the Coordinate Plane



In this activity, you will classify quadrilaterals by examining the lengths and relationships of their sides.



1. Graph quadrilateral $ABCD$ using points $A(-5, 6)$, $B(-8, 2)$, $C(-5, -2)$, and $D(-2, 2)$.
2. Consider the sides of quadrilateral $ABCD$.
 - a. Determine each side length of quadrilateral $ABCD$. Can you classify quadrilateral $ABCD$ from its side lengths? If so, identify the type of figure. If not, explain why not.



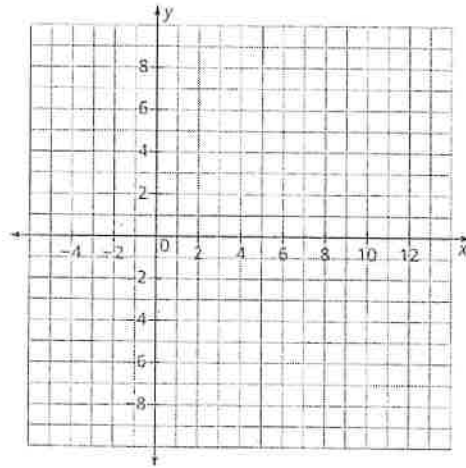
about:

What is the difference between a square and a rhombus?

- b. Determine the slope of each line segment in the quadrilateral. Describe the relationship between the slopes. Can you identify the figure? If so, identify the type of figure. If not, explain why not.



3. Graph quadrilateral $ABCD$ using points $A(8, 8)$, $B(3, -7)$, $C(10, -6)$, and $D(13, 3)$. Classify this quadrilateral as a trapezoid, a rhombus, a rectangle, a square, or none of these. Explain your reasoning.



Think

about:

Which types of figures can you eliminate as you determine information about the figure?