Prerequisite: Group Quadrilaterals

Study the example problem showing how to group quadrilaterals. Then solve problems 1–10.

Example

Which quadrilaterals do not have opposite sides that are the same length?

Shape B has no opposite sides and the sides are all different lengths.

Shapes C and F have a pair of opposite sides, but they are not the same length.

Shapes B, C, and F do not belong to the group “opposite sides the same length.”

Use the shapes shown above to answer problems 1–5.

1 Which quadrilaterals above have all sides the same length?

2 Which quadrilaterals have no square corners?

3 Which quadrilaterals have at least 1 square corner?

4 Which quadrilaterals have all square corners?

5 Name a group that all of the shapes above belong to.
Solve. Use the shapes on the right to solve problems 6–8.

6 Which shapes belong to the group “two pairs of opposite sides”?

7 Which shapes do not belong to the group “opposite sides are the same length”?

8 Write the name of a group that neither shape belongs to. Explain.

9 Draw two different quadrilaterals that belong to the group “no sides are the same length.”

10 Draw two different quadrilaterals that do not belong to the group “at least 1 square corner.”

Vocabulary

rhombus
a quadrilateral with 2 pairs of parallel sides and 4 sides that are the same length.
Compare Quadrilaterals

Study the example problem showing how to compare quadrilaterals. Then solve problems 1–7.

Example

Which of these shapes are parallelograms?

You can list the attributes of a parallelogram in a table. Check if each shape has these attributes.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Trapezoid</th>
<th>Rhombus</th>
<th>Rectangle</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 sides</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>4 angles</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>2 pairs of parallel sides</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>2 pairs of sides that are the same length</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

A rhombus and a rectangle have all the attributes of a parallelogram.

1. Is shape A a parallelogram? Explain.

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

2. What is another kind of quadrilateral that is also a parallelogram? Explain.

   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

3. Fill in the blanks. Use information from the table above.
   Every ______________________ is a parallelogram.
   Every ______________________ is a parallelogram.

Vocabulary

attribute a way to describe a shape, like number of sides or length of sides.
Solve. Use the table to solve problems 4–7.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Parallelogram</th>
<th>Rhombus</th>
<th>Rectangle</th>
<th>Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 sides 4 angles</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>4 square corners</td>
<td>sometimes</td>
<td>sometimes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>2 pairs of parallel sides</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>2 pairs of sides that are the same length</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

4. Circle all the quadrilaterals that are rhombuses.

5. Circle all the quadrilaterals that are rectangles.

6. Tell whether each sentence is True or False.

   a. All squares are rectangles.  
      [ ] True  [ ] False

   b. All rectangles are parallelograms.  
      [ ] True  [ ] False

   c. All parallelograms are rectangles.  
      [ ] True  [ ] False

   d. All quadrilaterals are parallelograms.  
      [ ] True  [ ] False

   e. All parallelograms are quadrilaterals.  
      [ ] True  [ ] False

7. Jaime says that some rectangles are not squares. Do you agree? Explain.
Name and Draw Quadrilaterals

Study the example showing how to name a quadrilateral. Then solve problems 1–9.

Example

Justin is drawing a quadrilateral with opposite sides that are the same length. All 4 sides are not the same length. What quadrilaterals can Justin draw?

Make a drawing to see what the quadrilaterals might look like.

- Opposite sides are the same length. The shape has 4 square corners.
- Opposite sides are the same length. The shape has no square corners.

Justin can draw a rectangle or a parallelogram.

Use the shape on the right to answer problems 1–5.

1 One wall of a shed looks like the shape on the right. How many sides and angles does the shape have?

2 How many parallel sides does the shape have?

3 How many square corners does the shape have?

4 Does the shape have 2 pairs of sides the same length?

5 Circle all the words you can use to name this shape.

quadrilateral parallelogram rectangle

Vocabulary

parallelogram a quadrilateral with 2 pairs of parallel sides and 2 pairs of sides that are the same length.

circle a quadrilateral with 4 square corners, 2 pairs of parallel sides, and 2 pairs of sides that are the same length.
Use the clues and shapes A–E to solve problems 6–8.

6 I have 4 sides. I am a parallelogram.
I have all square corners.
I am not a square.
I am shape ______.  
I am a ____________________.

7 I am a quadrilateral.
I do not have any square corners.
My sides are all the same length.
I am shape ______.  
I am a ____________________.

8 All of my corners are square corners.
Some of my sides are the same length.
I am not a quadrilateral.
I am shape ______.  
I am a ____________________.

9 Draw a quadrilateral that has at least 3 square corners and 2 pairs of parallel sides. Write all of the possible names for your shape. Tell why the names fit.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Classify Quadrilaterals

Solve the problems.

1. Which parallelogram is NOT a rectangle?
   - A
   - C
   - B
   - D

Beth chose A as the correct answer. How did she get that answer?

2. Which of these are attributes of a square? Circle all the correct answers.
   - A 4 sides and 4 angles
   - B all sides the same length
   - C no square corners
   - D 2 pairs of parallel sides
   - E opposite sides that are the same length

3. Draw a quadrilateral with 1 pair of parallel sides and no sides the same length.
Solve.

4 Tell whether each sentence is True or False.
   a. All rhombuses are squares.
      □ True □ False
   b. All squares are rectangles.
      □ True □ False
   c. All rectangles are parallelograms.
      □ True □ False
   d. Some quadrilaterals are parallelograms.
      □ True □ False

5 What one name describes all of these shapes?

Solution: _____________________________

6 Draw a shape that belongs to at least two of these groups: parallelogram, rhombus, or rectangle. Explain why your shape belongs to these groups.

Solution: _____________________________

______________________________
______________________________
______________________________
______________________________