Name _____

Classify Quadrilaterals

Essential Question How can you sort and classify quadrilaterals?

## Unlock the Problem Real World

A quadrilateral is a polygon with four sides and four angles. You can name a quadrilateral by the vertices of its angles.

Quadrilateral *ABCD* is a possible name for the figure shown at the right. Quadrilateral *ACBD* is not a possible name, since points *A* and *C* are not endpoints of the same side.

Assume that line segments that appear to be parallel are parallel.
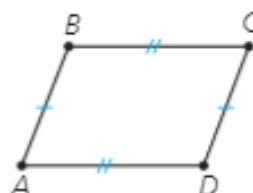
The tick marks on the line segments show that they have the same length. Sides *AD* and *BC* have the same length. Sides *AB* and *CD* have the same length.

Common Quadrilaterals

Trapezoid
• at least 1 pair of parallel sides

Parallelogram
• 2 pairs of parallel sides
• 2 pairs of sides of equal length

Rhombus
• 2 pairs of parallel sides
• 4 sides of equal length

Rectangle
• 2 pairs of parallel sides
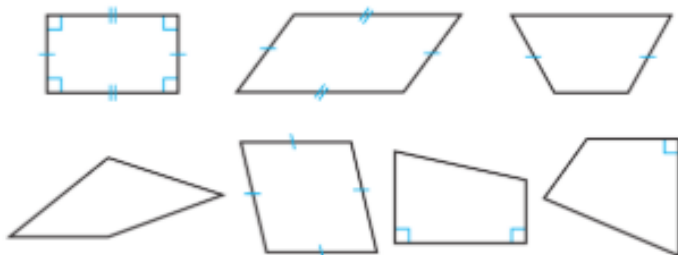• 2 pairs of sides of equal length
• 4 right angles

Square
• 2 pairs of parallel sides
• 4 sides of equal length
• 4 right angles

🔒 Activity 1 Identify right angles in quadrilaterals.

Materials ■ color pencils

Use the Quadrilateral Color Guide to color the quadrilaterals.

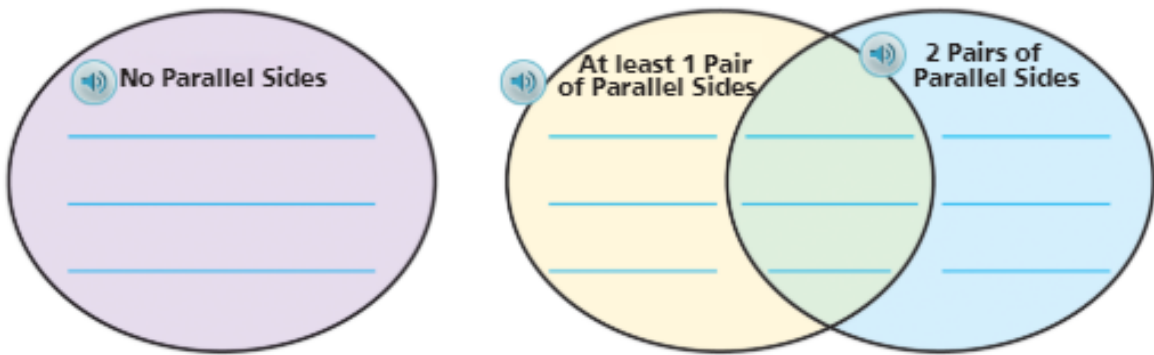| Quadrilateral Color Guide	
RED:	exactly 4 right angles
BLUE:	exactly 2 right angles
ORANGE:	exactly 1 right angle

Math Talk MATHEMATICAL PRACTICES ⑥

Can a quadrilateral have exactly 3 right angles? **Explain.**

4th Math CH 10

🔒 Activity 2 Use a Venn diagram to sort quadrilaterals.

Write the names of the quadrilaterals in the Venn diagram.

🔊 Quadrilaterals

No Parallel Sides

_____

_____

_____

At least 1 Pair of Parallel Sides

_____

_____

_____
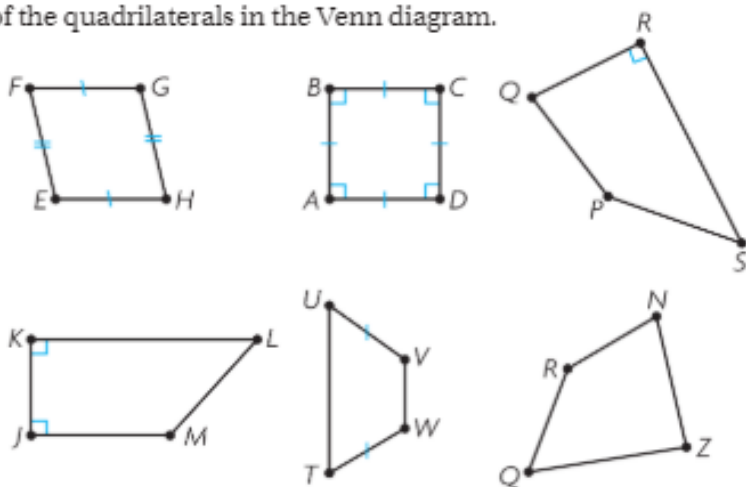
2 Pairs of Parallel Sides

_____

_____

_____

🔊 **Try This!** Classify each figure as many ways as possible. Write *quadrilateral, trapezoid, parallelogram, rhombus, rectangle,* or *square.*

a.

_____

_____

_____

b.

_____

_____
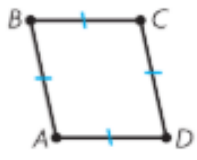
_____

c.

_____

_____

_____

4ᵗʰ Math CH 10

Name _____

Share and Show

1. Tell whether the quadrilateral is also a trapezoid, parallelogram, rhombus, rectangle, or square.

Think: _____ pairs of parallel sides

_____ sides of equal length

_____ right angles

Quadrilateral *ABCD* is also a _____.

Classify each figure as many ways as possible. Write *quadrilateral, trapezoid, parallelogram, rhombus, rectangle,* or *square*.
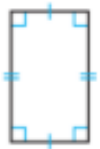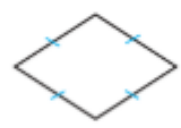
2.

_____

_____

_____

3.

_____

_____

_____

4.

_____

_____

_____

On Your Own

Classify each figure as many ways as possible. Write *quadrilateral, trapezoid, parallelogram, rhombus, rectangle,* or *square*.

5.

_____

_____

_____

6.

_____

_____

_____

7.

_____

_____

_____

Math Talk

MATHEMATICAL PRACTICES ②

Use Reasoning How would you classify a figure with 4 sides, none of which are parallel? Explain.

4th Math CH 10

Problem Solving · Applications (Real World)

8. **THINK SMARTER** Explain how a rhombus and square are alike, and how they are different.

_____

_____

_____

_____

_____

_____

9. **THINK SMARTER** Classify the figure. Select all that apply.

○ quadrilateral   ○ rectangle

○ trapezoid   ○ rhombus

○ parallelogram   ○ square

Connect to Art

The Louvre Museum is located in Paris, France. Architect I. M. Pei designed the glass and metal structure at the main entrance of the museum. This structure is called the Louvre Pyramid.

Below is a diagram of part of the entrance to the Louvre Pyramid.

10. **MATHEMATICAL PRACTICE ①** Describe the quadrilaterals you see in the diagram.

_____

_____

_____

_____

_____

11. **GO DEEPER** How many triangles do you see in the diagram? Explain.

_____

_____

_____

_____

_____

4th Math CH 10

Name _____

✓ Mid-Chapter Checkpoint

Personal Math Trainer
Online Assessment and Intervention

Vocabulary

Choose the best term from the box to complete the sentence.

1. A _____ is part of a line between two endpoints. (p. 549)

2. A _____ forms a square corner. (p. 550)

3. An _____ is greater than a right angle and less than a straight angle. (p. 550)

4. The two-dimensional figure that has one endpoint is a

   _____ . (p. 549)

5. An angle that forms a line is called a _____ . (p. 550)

Vocabulary

acute angle
line segment
obtuse angle
ray
right angle
straight angle

Concepts and Skills

6. On the grid to the right, draw a polygon that has 2 pairs of parallel sides, 2 pairs of sides equal in length, and 2 acute and 2 obtuse angles. Tell all the possible names for the figure. (4.G.A.2)

_____
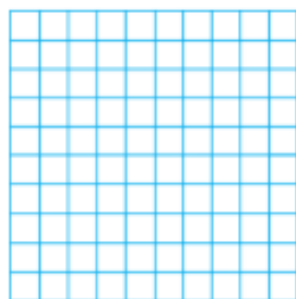
Draw the figure. (4.G.A.1)

7. parallel lines

8. obtuse ∠ABC

9. intersecting lines that are not perpendicular

10. acute ∠RST

4th Math CH 10

11. Which triangle has one right angle? **(4.G.A.2)**

_____

12. A figure has 2 pairs of parallel sides, 2 pairs of sides of equal length, and 4 right angles. What quadrilateral best describes this figure? **(4.G.A.2)**

_____

13. Which quadrilateral can have 2 pairs of parallel sides, all sides with equal length, and no right angles? **(4.G.A.2)**

_____

14. What is the correct name of the figure shown? **(4.G.A.1)**

_____

15. **GO DEEPER** Describe the angles of an obtuse triangle. **(4.G.A.2)**

_____

_____

_____

_____

Line Symmetry

Essential Question How can you check if a shape has line symmetry?

Common Core — Geometry— 4.G.A.3

MATHEMATICAL PRACTICES
MP2, MP3, MP6

🔑 Unlock the Problem Real World

One type of symmetry found in geometric shapes is line symmetry. This sign is in the hills above Hollywood, California. Do any of the letters in the Hollywood sign show line symmetry?

A shape has **line symmetry** if it can be folded about a line so that its two parts match exactly.

A fold line, or a **line of symmetry**, divides a shape into two parts that are the same size and shape.

🔒 Activity Explore line symmetry.

Materials ■ pattern blocks ■ scissors

A Does the letter W have line symmetry?

Math Idea

A vertical line goes up and down. ↕

A horizontal line goes left and right. ↔

A diagonal line goes through vertices of a polygon that are not next to each other. It can go up and down and left and right. ↗ ↙

STEP 1 Use pattern blocks to make the letter W.

STEP 2 Trace the letter.

STEP 3 Cut out the tracing.
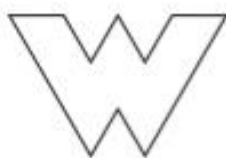
STEP 4 Fold the tracing over a vertical line.

Think: The two parts of the folded W match exactly. The fold line is a line of symmetry.

Math Talk **MATHEMATICAL PRACTICES ③**

Apply How can you check to see if a shape has line symmetry?

So, the letter W _____ line symmetry.

4th Math CH 10

B Does the letter L have line symmetry?

STEP 1

Use pattern blocks or grid paper to make the letter L.

STEP 2

Trace the letter.

STEP 3

Cut out the tracing.

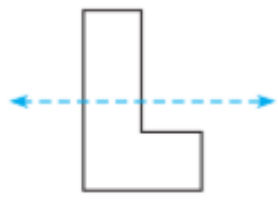**STEP 4**

Fold the tracing over a vertical line.

Do the two parts match exactly?
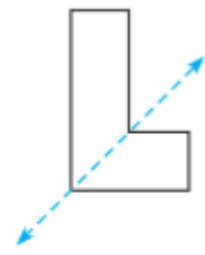
_____

STEP 5

Then open it and fold it horizontally.

Do the two parts match exactly?

_____

STEP 6

Then open it and fold it diagonally.

Do the two parts match exactly?

_____

So, the letter L _____ line symmetry.

1. Repeat Steps 1–6 for the remaining letters in HOLLYWOOD. Which letters have line symmetry?

_____

2. Do any of the letters have more than one line of symmetry? Explain.

_____

_____

Remember

You can fold horizontally, vertically, or diagonally to determine if the parts match exactly.

4th Math CH 10
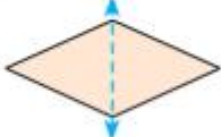
Name _____
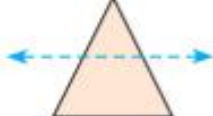
Share and Show [MATH BOARD]

**Tell whether the parts on each side of the line match.
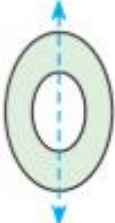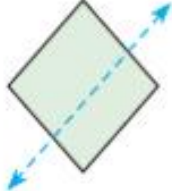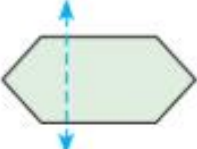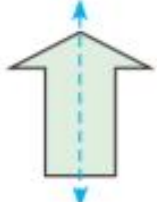Is the line a line of symmetry? Write *yes* or *no*.**

1. _____   2. _____   3. _____   ✔4. _____

**Tell if the blue line appears to be a line of symmetry.
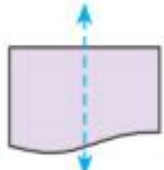Write *yes* or *no*.**

5. _____   6. _____   7. _____   ✔8. _____
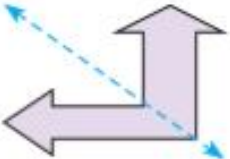
Math Talk

MATHEMATICAL PRACTICES 2

Use Reasoning How can you use paper folding to check if a shape has line symmetry?

On Your Own

**Tell if the blue line appears to be a line of symmetry.
Write *yes* or *no*.**

9. _____   10. _____   11. _____   12. _____

13. GO DEEPER Which best describes the symmetry in the letter I?

I

_____

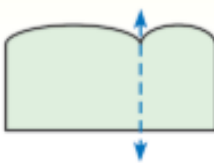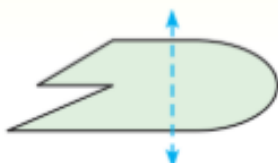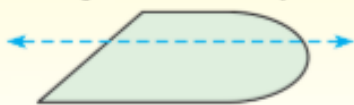4ᵗʰ Math CH 10

🔑 Unlock the Problem
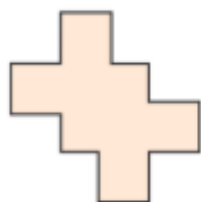
14. Which shape has a correctly drawn line of symmetry?

a. What do you need to find? _____

_____

b. How can you tell if the line of symmetry is correct?

_____

c. Tell how you solved the problem.

_____

_____

d. Circle the correct shape above.

15. MATHEMATICAL PRACTICE ② **Reason Abstractly** Draw a line of symmetry in the figure shown.

Personal Math Trainer

16. THINK SMARTER ➕ Evie's birthday is on the 18th of May. Since May is the 5th month, Evie wrote the date as shown.

5/18

Evie says all the numbers she wrote have line symmetry. Is she correct? Explain.

_____

_____

_____

578