Lesson 32

Classify Quadrilaterals

Name: _____

Prerequisite: Group Quadrilaterals

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

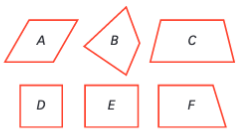
Example

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.

B 1 Which quadrilaterals above have all sides the same length?

shapes *A* and *D*

B 2 Which quadrilaterals have no square corners?

shapes *A*, *B*, and *C*

B 3 Which quadrilaterals have at least 1 square corner?

shapes *D*, *E*, and *F*

B 4 Which quadrilaterals have all square corners?

shapes *D* and *E*

M 5 Name a group that all of the shapes above belong to.

Possible answers: 4 sides and 4 angles or quadrilateral

Solve. Use the shapes on the right to solve problems 6–8.


parallelogram


rhombus

B 6 Which shapes belong to the group "two pairs of opposite sides"?

both the parallelogram and rhombus

B 7 Which shapes do not belong to the group "opposite sides are the same length"?

only the parallelogram

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

Possible answer: Neither shape belongs to the group "all sides are different lengths." The parallelogram has two pairs of sides that are the same length. The rhombus has all sides the same length.

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

Possible answer:

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

Possible answer:

Vocabulary

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

Key		
B Basic	**M** Medium	**C** Challenge

Name: _____

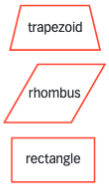
Compare Quadrilaterals

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.



Attribute	Trapezoid	Rhombus	Rectangle
4 sides	yes	yes	yes
4 angles	yes	yes	yes
2 pairs of parallel sides	no	yes	yes
2 pairs of sides that are the same length	no	yes	yes

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

M 1 Is shape *A* a parallelogram? Explain.

Possible answer: Shape *A* is not a parallelogram. It has most of the attributes of a parallelogram, but not 2 pairs of parallel sides.

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

Possible answer: A square is also a parallelogram. It has all the attributes of a parallelogram.

B 3 Fill in the blanks. Use information from the table above.

Every rhombus is a parallelogram.

Every rectangle 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.

Attribute	Parallelogram	Rhombus	Rectangle	Square
4 sides 4 angles	yes	yes	yes	yes
4 square corners	sometimes	sometimes	yes	yes
2 pairs of parallel sides	yes	yes	yes	yes
2 pairs of sides that are the same length	yes	yes	yes	yes

M 4 Circle all the quadrilaterals that are rhombuses.

B 5 Circle all the quadrilaterals that are rectangles.

M 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

C 7 Jaime says that some rectangles are not squares. Do you agree? Explain.

Possible answer: I agree. A rectangle is a square only if it has 4 equal sides. Rectangles only sometimes have 4 equal sides.

Lesson 32

Name: _____

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.

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

The shape has 4 sides and 4 angles.

B 2 How many parallel sides does the shape have?

The shape has 1 pair of parallel sides.

B 3 How many square corners does the shape have?

The shape has 2 square corners.

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

No, the shape has no sides the same length.

M 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.

rectangle 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.

M 6 I have 4 sides. I am a parallelogram.
I have all square corners.
I am not a square.

I am shape **D**.

I am a **rectangle**.

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

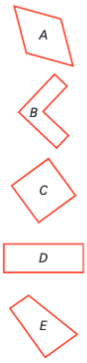
I am shape **A**.

I am a **rhombus**.

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

I am shape **B**.

I am a **hexagon**.



C 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.

Possible drawing:

Students should realize that if this quadrilateral has at least 3 square corners, it must have 4 square corners. They draw a rectangle.

Possible explanation: The shape has 4 sides and 4 angles. It has opposite sides that are parallel and the same length. It has all the attributes of a quadrilateral, parallelogram, and rectangle.

Name: _____

Classify Quadrilaterals

Solve the problems.

C **1** Which parallelogram is NOT a rectangle?

A 

C 

B 

D 

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

Possible answer: She may not understand that all squares are rectangles.

I would list all the attributes of a rectangle.

M **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

It may help to draw a picture of a square.

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

Possible drawing:

You might want to draw the parallel sides first.

Solve.

M **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

Compare the attributes of both shapes named in each sentence.

M **5** What one name describes all of these shapes?

Solution: **quadrilateral**

A shape must have all of the attributes of a kind of shape in order to have its name.

C **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.

Possible answer:

Solution: **My shape has 2 pairs of parallel sides and 2 pairs of sides that are the same length. It is a parallelogram. My shape also has 4 square corners. It is a rectangle.**

Think about the attributes of each shape before you draw your shape.

Name: _____

Subtract. Regroup twice if necessary. **Form B**

1 384 − 317 = 67	2 581 − 92 = 489	3 480 − 120 = 360	4 516 − 284 = 232	5 654 − 432 = 222
6 440 − 176 = 264	7 255 − 123 = 132	8 629 − 361 = 268	9 762 − 155 = 607	10 374 − 288 = 86
11 598 − 43 = 555	12 388 − 139 = 249	13 555 − 199 = 356	14 625 − 167 = 458	15 454 − 380 = 74
16 333 − 284 = 49	17 948 − 73 = 875	18 459 − 244 = 215	19 572 − 152 = 420	20 843 − 482 = 361
21 442 − 134 = 308	22 639 − 413 = 226	23 867 − 676 = 191	24 191 − 103 = 88	25 546 − 69 = 477

Subtract within 1,000—Skills Practice

Name: _____

Subtract across zeros. **Form A**

1 302 − 143 = 159	2 505 − 228 = 277	3 400 − 222 = 178	4 180 − 126 = 54	5 600 − 385 = 215
6 704 − 372 = 332	7 300 − 114 = 186	8 508 − 459 = 49	9 800 − 65 = 735	10 206 − 108 = 98
11 200 − 112 = 88	12 803 − 44 = 759	13 500 − 125 = 375	14 301 − 142 = 159	15 450 − 226 = 224
16 701 − 78 = 623	17 160 − 116 = 44	18 302 − 94 = 208	19 900 − 470 = 430	20 200 − 122 = 78
21 600 − 305 = 295	22 404 − 266 = 138	23 300 − 137 = 163	24 707 − 378 = 329	25 209 − 129 = 80