

EXPLORING QUADRILATERALS

Division 2 Mathematics · Mr. Merrick · January 15, 2026

Quadrilateral Definitions (with pictures)

A quadrilateral is a polygon with _____ sides.^a

Type	Definition	Picture
Quadrilateral	A polygon with 4 sides.	
Trapezoid	Exactly one pair of opposite sides is parallel.	
Kite	Two pairs of equal adjacent sides.	
Parallelogram	Both pairs of opposite sides are parallel.	
Rectangle	A quadrilateral with 4 right angles.	
Rhombus	A quadrilateral with 4 equal side lengths.	
Square	A rectangle with 4 equal sides.	

Quick check: Circle all that are always true.

- A square is a rectangle.
- A rectangle is a rhombus.
- A square is a kite.
- A trapezoid is a parallelogram.

^aWe will only explore *simple* quadrilaterals (no sides cross). *Complex* quadrilaterals also exist:
<https://mathmonks.com/quadrilateral/simple-and-complex-quadrilateral>

True or False?

Directions: Write T or F. Then justify in 1–2 sentences (or with a counterexample).

1. All squares are rhombuses.

2. All rectangles are squares.

3. There exists a rectangle that is a rhombus.

4. Every rhombus is a square.

5. Every square is a parallelogram.

6. If a quadrilateral has 4 right angles, then it is a rectangle.

7. A trapezoid can have 2 right angles.

8. No trapezoid is a parallelogram.

9. If both pairs of opposite sides are parallel, then it is a parallelogram.

10. A kite must have 4 equal sides.

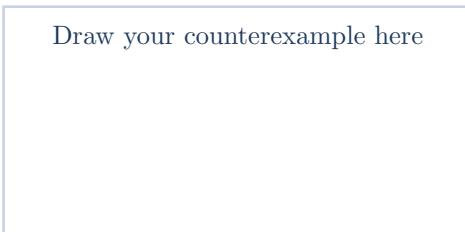
Proof Practice

Directions: Answer in complete sentences.

1. Explain why every square is a rectangle.

2. Give a counterexample to show that not every kite is a rhombus. You may draw it.

Draw your counterexample here



3. Is it possible for a trapezoid (exactly one pair of parallel sides) to also be a parallelogram? Explain.

Challenge: Always / Sometimes / Never

Directions: Write Always, Sometimes, or Never. Then give a reason.

- 1) A rectangle is a parallelogram.

- 2) A kite is a rhombus.

- 3) A trapezoid has at least one pair of parallel sides.

- 4) A quadrilateral is convex.

- 5) A square is a kite.

Classification Practice

Directions: For each picture, write all names that apply. (Example: a square is also a rectangle, rhombus, parallelogram, kite, and quadrilateral.)

