Classifying Two-Dimensional Figures

Classifying Two-Dimensional Figures: Find, Fix, and Work Backward

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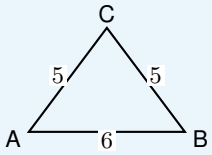
QUICK REVIEW

Classify a closed figure with straight sides first by its side count. Then use equal lengths, right-angle squares, and matching arrows on parallel sides. All right angles are marked in the shape diagrams. One figure can belong to more than one group.

Worked example

Use the marked lengths to classify ABC by its sides.

1. AC and BC are each labeled 5, giving an equal pair.
2. AB is 6, and $6 \neq 5$. Exactly 2 sides are equal, so the triangle is isosceles but not equilateral.
Answer: Isosceles, not equilateral.



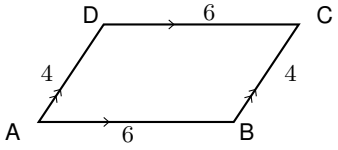
Practice Problems

Show your thinking.

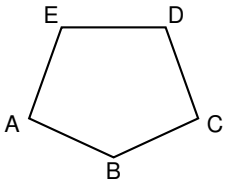
1. One whole side of a pentagon outline is erased. A student calls the remaining outline a quadrilateral because four segments remain. Correct the claim.

2. A builder labels a triangular panel with side lengths $7, 9, 7$ cm as scalene. What side-length label belongs on it, and why?

3. A student says turning the pictured panel a quarter turn makes it a rectangle. Would the turn change its classification? Explain.



4. Why can the pictured sign go in a polygon folder but a circular sign cannot, even though both boundaries are closed?



5. A triangle has angles $105°, 45°, 30°$. Mari calls it acute because two angles are less than $90°$. Correct the angle classification.

6. A label for a closed four-sided figure with all right angles says it has five vertices. Explain why this count is impossible and give a correct group name.

Answer Key

1. It is not a polygon because its boundary is open.
2. Isosceles, not scalene or equilateral.
3. No. It is still a parallelogram, not a rectangle.
4. The pictured sign has straight sides; the circle has a curved boundary.
5. Obtuse triangle.
6. 4 vertices. It is a rectangle.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Erasing one side leaves $5 - 1 = 4$ straight segments.

2. The erased side leaves 2 endpoints that no longer meet. A quadrilateral needs a closed boundary, not just 4 segments.

Problem 2

1. $7 = 7$, so there is an equal pair and the triangle is not scalene.

2. $9 \neq 7$, so not all 3 lengths match. The equal pair makes the triangle isosceles.

Problem 3

1. A turn preserves the 2 parallel pairs: $AB \parallel CD$ and $BC \parallel AD$.

2. A turn also preserves the 0 right angles. It cannot supply the 4 right angles a rectangle needs.

Problem 4

1. The picture has 5 straight segments that join end to end and close.

2. The circle has 0 straight sides. Being closed is necessary for a polygon but is not enough.

Problem 5

1. 45° and 30° are below 90°, but acute would require all 3 angles below 90°.

2. $105^\circ > 90^\circ$, so the one obtuse angle makes the triangle obtuse.

Problem 6

1. A closed boundary with 4 sides has one vertex at each side join, so it has 4 vertices, not 5.

2. The 4 right angles make it a rectangle. Nothing given requires all sides to be equal.

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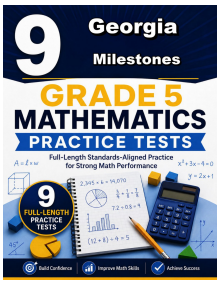

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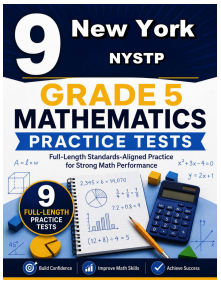

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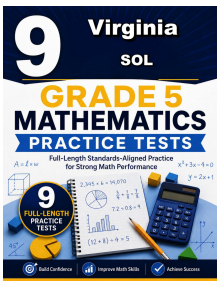

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