

Chapter 6 – Polygons and Quadrilaterals.

6.1 – Properties of Polygons

Warm Up

1. A ? is a three-sided polygon.

triangle

2. A ? is a four-sided polygon.

quadrilateral

Evaluate each expression for $n = 6$.

3. $(n - 4) 12$

24

4. $(n - 3) 90$

270

Solve for a .

5. $12a + 4a + 9a = 100$

4

Objectives

Classify polygons based on their sides and angles.

Find and use the measures of interior and exterior angles of polygons.

Vocabulary

side of a polygon

vertex of a polygon

diagonal

regular polygon

concave

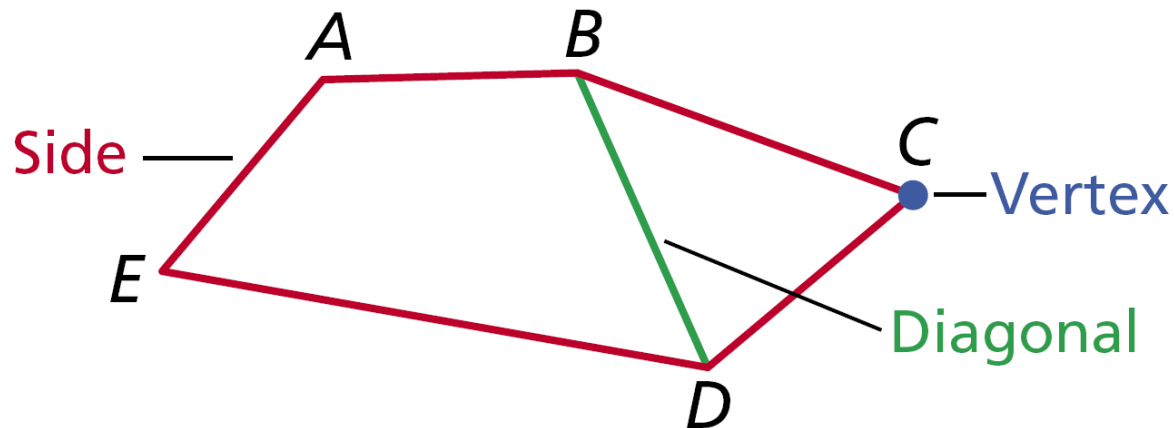
convex

A polygon is a closed plane figure formed by three or more segments that intersect only at their endpoints.

side of the polygon - segments that forms a polygon

vertex of the polygon - common endpoint of two sides

Diagonal - A segment that connects any two
nonconsecutive vertices

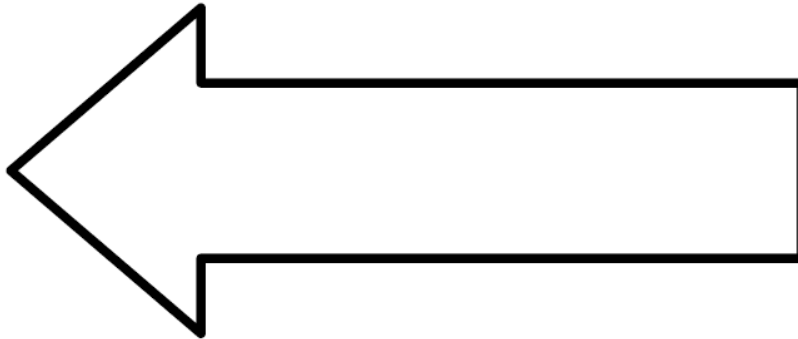


You can name a polygon by the number of its sides.

Number of Sides	Name of Polygon
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon
10	Decagon
12	Dodecagon
n	n -gon

Example 1B: Identifying Polygons

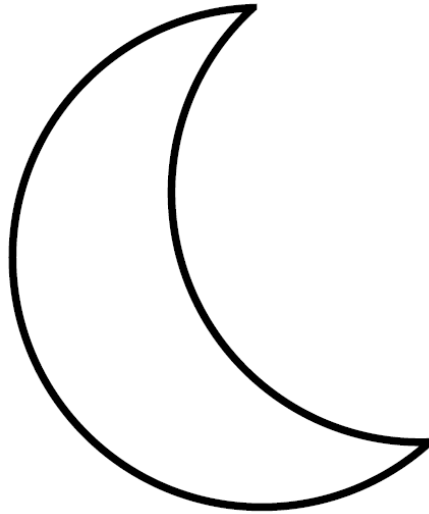
Tell whether the figure is a polygon. If it is a polygon, name it by the number of sides.



polygon, heptagon

Example 1C: Identifying Polygons

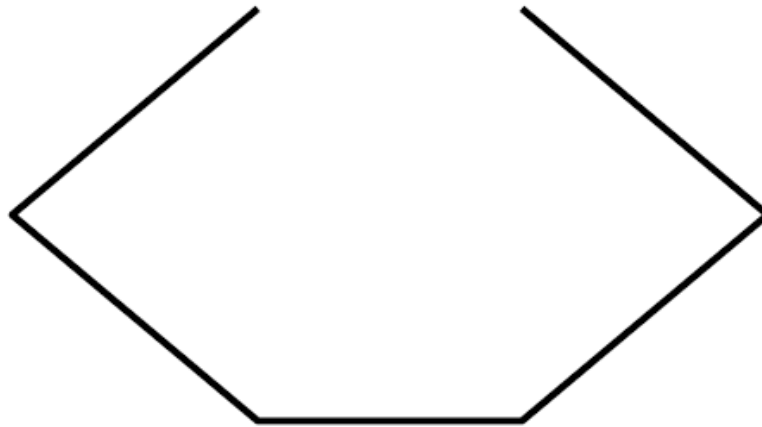
Tell whether the figure is a polygon. If it is a polygon, name it by the number of sides.



not a polygon

Check It Out! Example 1a

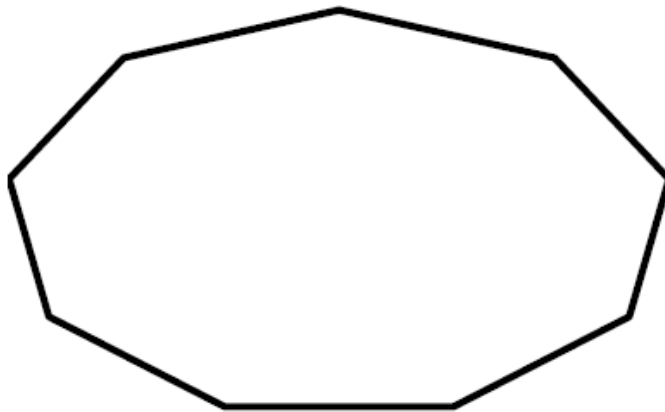
Tell whether each figure is a polygon. If it is a polygon, name it by the number of its sides.



not a polygon

Check It Out! Example 1b

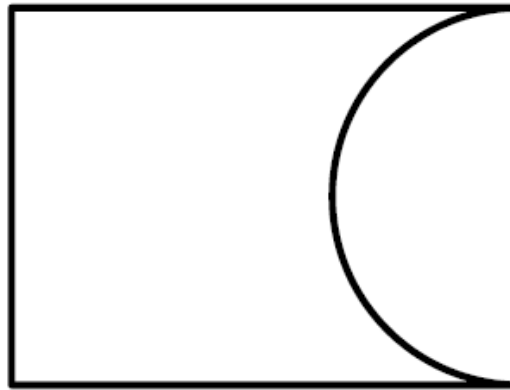
Tell whether the figure is a polygon. If it is a polygon, name it by the number of its sides.



polygon, nonagon

Check It Out! Example 1c

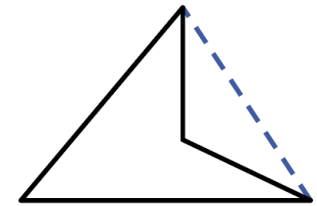
Tell whether the figure is a polygon. If it is a polygon, name it by the number of its sides.



not a polygon

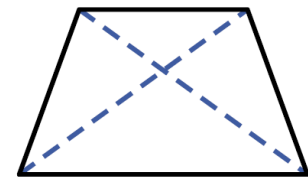
A polygon is concave if any part of a diagonal contains points in the exterior of the polygon.

(Concave – part of the shape is CAVED IN.)



Concave
quadrilateral

If no diagonal contains points in the exterior, then the polygon is convex.



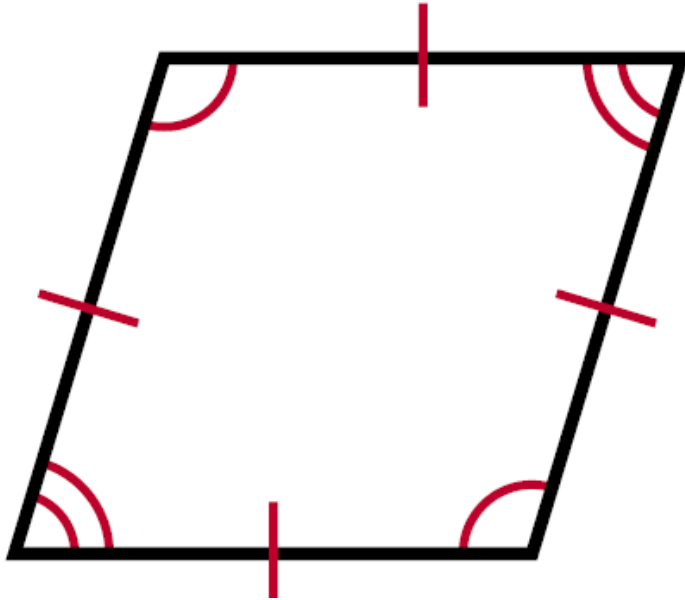
Convex
quadrilateral

A **regular polygon** is one that is both equilateral and equiangular. A regular polygon is always convex.

If a polygon is not regular, it is called irregular.

Example 2A: Classifying Polygons

Tell whether the polygon is regular or irregular. Tell whether it is concave or convex.



irregular, convex

Example 2B: Classifying Polygons

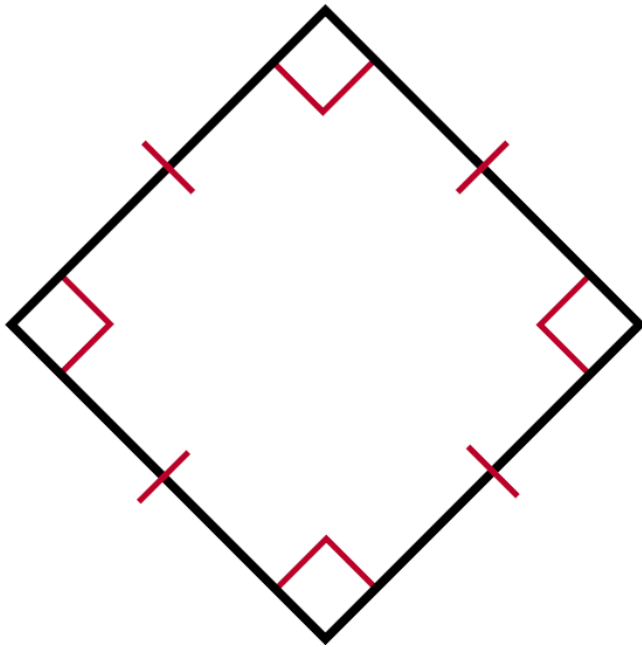
Tell whether the polygon is regular or irregular. Tell whether it is concave or convex.



irregular, concave

Example 2C: Classifying Polygons

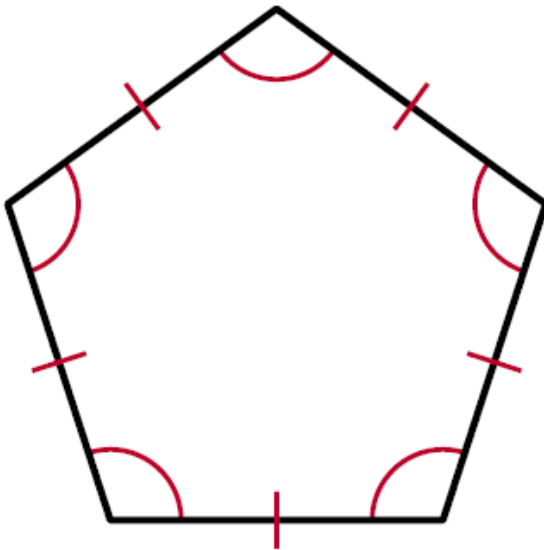
Tell whether the polygon is regular or irregular. Tell whether it is concave or convex.



regular, convex

Check It Out! Example 2a

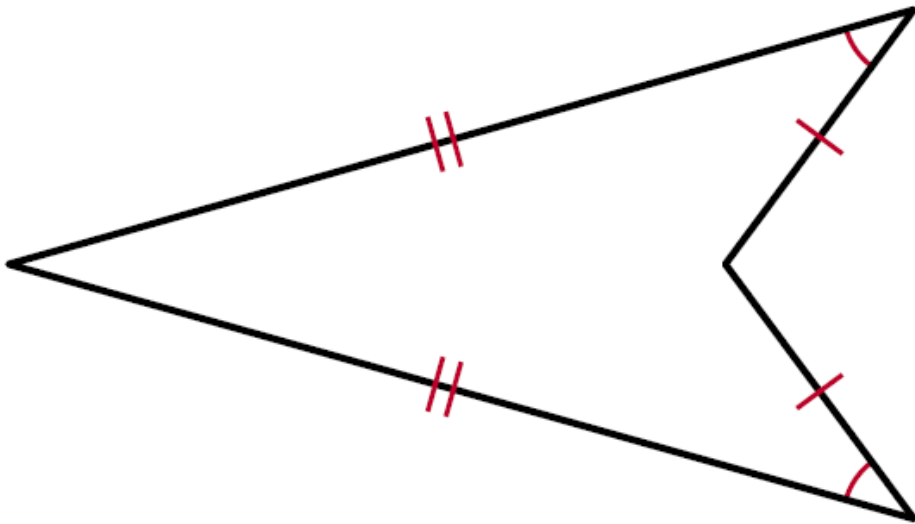
Tell whether the polygon is regular or irregular. Tell whether it is concave or convex.



regular, convex

Check It Out! Example 2b

Tell whether the polygon is regular or irregular. Tell whether it is concave or convex.



irregular, concave

