6.1 Polygons

Goal: to be able to identify and classify polygons and to be able to find the angle measures of quadrilaterals

Warm up

1. What is the sum of the measures of the interior angles of a triangle?
2. In which kind of triangle are all three sides congruent?
3. In which kind of triangle are all three angles congruent?

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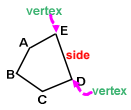
A **polygon** is a **plane**(2-dimensional), **closed** figure that is formed by three or more segments called **sides**. The endpoint of each side is a **vertex.**

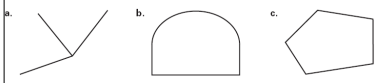


A segment that joins two nonconsecutive vertices of a polygon is called a **diagonal**.

Identify Polygons

Tell whether the figure is a polygon. Explain your reasoning.

a. b. c.



SOLUTION

a. No, the figure is not a polygon because each side intersects two other sides at one vertex, and no other sides at the other vertex.

b. No, the figure is not a polygon because it has a side that is not a segment.

c. Yes, the figure is a polygon formed by five straight sides.

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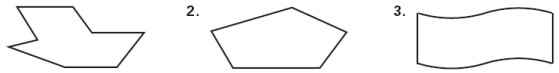
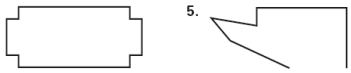
Tell whether the figure is a polygon. Explain your reasoning.

1. 2. 3.



4. 5.



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Types of Polygons

Triangle	3 Sides
Quadrilateral	4 sides
Pentagon	5 sides
Hexagon	6 sides
Heptagon	7 sides
Octagon	8 sides

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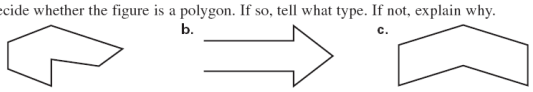
Classify Polygons

Decide whether the figure is a polygon. If so, tell what type. If not, explain why.

a. b. c.



SOLUTION

a. The figure is a polygon with seven sides, so it is a heptagon.

b. The figure is not a polygon because two of the sides intersect only one other side.

c. The figure is a polygon with six sides, so it is a hexagon.

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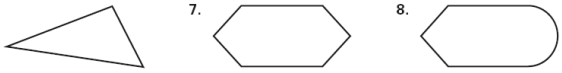
Decide whether the figure is a polygon. If so, tell what type. If not, explain why.

6. 7. 8.



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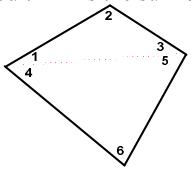
What do you think is the sum of the interior angles?



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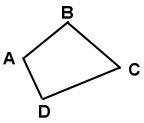
Quadrilateral Interior Angles Sum Theorem:

The sum of the measures of the interior angles of a quadrilateral is 360°

$m\angle A + m\angle B + m\angle C + m\angle D = 360^\circ$



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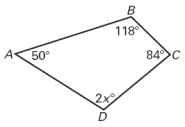
Use the Quadrilateral Interior Angles Theorem

Find the value of x.



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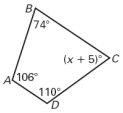
Find the value of x.

9.



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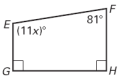

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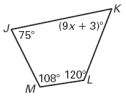

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