Sec 2.8 Geometry – Polygons & Quadrilaterals

**Polygon:** A closed plane figure formed by three or more segments such that each segment intersects or connects end to end to form a closed shape.

**Simple Polygon:** A polygon in which sides only share each endpoint with one other side.

**Regular Polygon:** A polygon that is both equilateral and equiangular

Determine whether each figure below is a polygon or not a polygon.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><img src="image1" alt="Triangle" /></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td><img src="image2" alt="Curved Figure" /></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td><img src="image3" alt="Polygon" /></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td><img src="image4" alt="Figure E" /></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td><img src="image5" alt="Figure X" /></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td><img src="image6" alt="Octagon" /></td>
</tr>
</tbody>
</table>

**Circle one of the following:**
- It is a Polygon
- Not a Polygon

Name if Polygon:

**Concave Polygon:** A polygon in which a diagonal can be drawn such that part of one of the diagonals contains point in the exterior of the polygon.

**Convex Polygon:** A polygon in which no diagonal contains points in the exterior of the polygon.

Determine whether each figure below is a Convex or Concave.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td><img src="image7" alt="Convex Polygon" /></td>
<td><img src="image8" alt="Concave Polygon" /></td>
</tr>
<tr>
<td>8.</td>
<td><img src="image9" alt="Convex Polygon" /></td>
<td><img src="image10" alt="Concave Polygon" /></td>
</tr>
<tr>
<td>9.</td>
<td><img src="image11" alt="Convex Polygon" /></td>
<td><img src="image12" alt="Concave Polygon" /></td>
</tr>
</tbody>
</table>

**Circle one of the following:**
- CONVEX
- CONCAVE
Quadrilateral: A four-sided polygon.

Parallelogram: A quadrilateral with two pairs of parallel sides.

Trapezoid: A quadrilateral with exactly one pair of parallel sides.

Rectangle: A quadrilateral with four right angles.

Rhombus: A quadrilateral with four congruent sides.

Square: A quadrilateral with four congruent sides and four right angles.

Kite: A quadrilateral with exactly two pairs of congruent consecutive sides but opposite sides are not congruent.

The Hierarchy of Quadrilaterals

Convex Quadrilateral

- Parallelograms
- Rhombi
- Squares
- Rectangles
- Trapezoids

Concave Quadrilateral

- Kites

Answer each of the following with ALWAYS, SOMETIMES, or NEVER

____________________10. A square is a rhombus.
____________________11. A rhombus is a square.
____________________12. A trapezoid is a parallelogram.
____________________13. A rectangle is a rhombus.
____________________14. A kite is a concave quadrilateral.
____________________15. A parallelogram is a rectangle.
____________________16. A rhombus is a trapezoid.
____________________17. A convex quadrilateral is a trapezoid.
____________________18. A rectangle is a parallelogram.
Using your knowledge of congruent triangles and parallel triangles determine the highest level and most appropriate definition of a quadrilateral for each ABCD quadrilateral below. Each definition in the word wall should be used exactly once. Briefly explain why for each quadrilateral.

Square
Convex-Quadrilateral
Parallelogram
Kite
Rhombus
Rectangle
Concave-Quadrilateral
Trapezoid

1. 

2. 

3. 

4. Both dashed figures can be assumed to be circles.

5. \( \triangle ABD \) and \( \triangle CBD \) are complimentary

6. 

7. 

8. 

M. Winking
Unit 2-8
page 62