

LESSON 3: POLYGON DEFINITIONS AND THEOREMS**1) POLYGON DEFINITIONS****Polygon**

A closed figure formed by 3 or more line segments.

Regular Polygon

A polygon that has equal sides and equal angles.

Types of Polygons

Number of Sides	Name
3	triangle
4	quadrilateral
5	pentagon
6	hexagon
7	heptagon
8	octagon

Interior Angles

The sum of the interior angles of a polygon is equal to $180(n-2)$, where n is the number of sides.

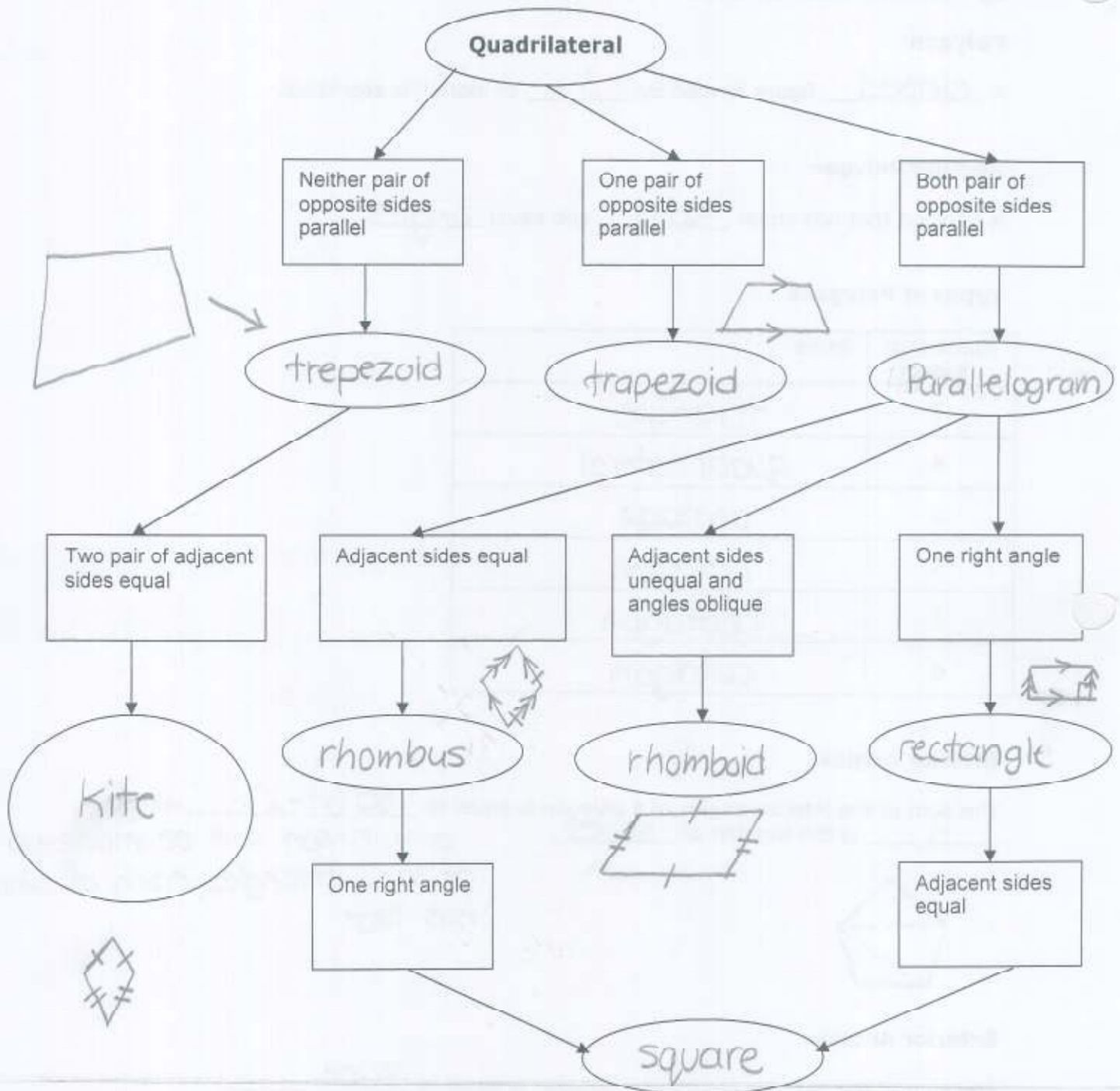
any n -gon can be made-up of $n-2$ triangles, each of which has 180°

**Exterior Angles**

The sum of the exterior angles of a polygon is equal to 360° .

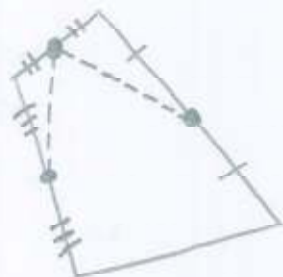


2) CLASSIFYING QUADRILATERALS

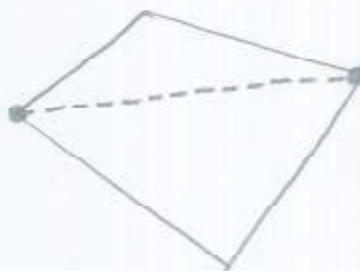


3) LINES IN A POLYGON**Midsegment**

A line segment joining the midpoint of two adjacent sides of a polygon.

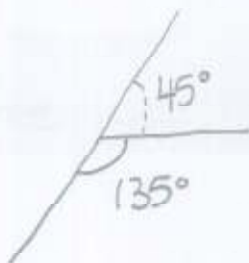
**Diagonal**

A line segment joining two non-adjacent vertices of a polygon.

**4) EXAMPLE**

Each interior angle of a regular polygon is 135°. How many sides does it have?

↑ Equal angles



sum of interior angles

$$180(n-2) = 135n$$

$$18n - 360 = 135n$$

$$45n = 360$$

$$n = 8$$

sum of exterior angles

$$360^\circ = 45^\circ n$$

$$n = 8$$

8 sides

