



A **regular** polygon has all equal lengths and all its angles are equal.



Angles in parallel lines and polygons



An **irregular** polygon has sides and angles of different sizes.

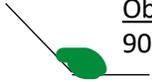
Basic angle rules



Acute angle
 $0^\circ < \text{angle} < 90^\circ$



Angles on a straight line sum to 180°



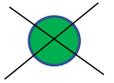
Obtuse angle
 $90^\circ < \text{angle} < 180^\circ$



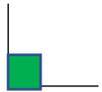
Vertically opposite angles are equal



Reflex angle
 $180^\circ < \text{angle} < 360^\circ$



Angles around a point sum to 360°

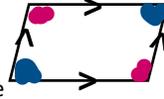


Right angle
is 90°

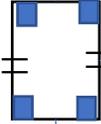
Properties of Quadrilaterals



Square
All sides equal
All angles 90°
Opposite sides are parallel



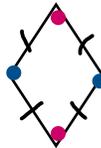
Parallelogram
Opposite sides are parallel.
Opposite angles are equal.
Has co-interior angles



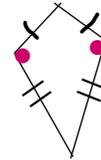
Rectangle
All angles 90°
Two pairs equal sides.
Opposite sides parallel.



Trapezium
One pair of parallel lines

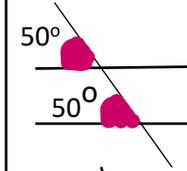


Rhombus
All sides equal
Opposite angles are equal.

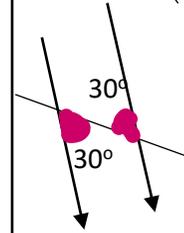


Kite
No parallel lines.
Two pairs of equal lengths
One pair of equal opposite angles.

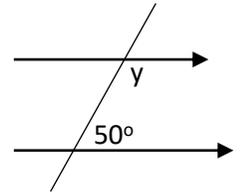
Parallel Lines



Corresponding angles are equal



Alternate angles are equal

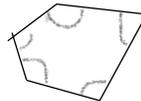


Co-Interior angles sum to 180°
Also known as 'Allied angles'

$$y = 180 - 50 = 130^\circ$$

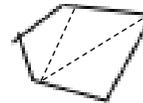
Common polygons	Number of sides	Name
	5	Pentagon
	6	Hexagon
	7	Heptagon
	8	Octagon
	9	Nonagon
	10	Decagon

Sum of Interior angles = (number of sides - 2) x 180



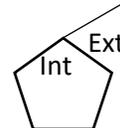
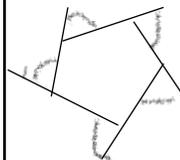
Interior angles are enclosed by the polygon

$$\text{Sum of interior angles} = (5 - 2) \times 180 = 540^\circ$$



This irregular pentagon can be split up into 3 triangles and each triangle has an angle sum of 180°
Hence $3 \times 180 = 540^\circ$

Sum of exterior angles



An interior angle is adjacent to an exterior angle in all polygons.
Therefore
Interior + exterior = 180°

Exterior angles all add up to 360°

Missing angles in regular polygons

Exterior angle in regular polygons

$$= 360^\circ \div \text{number of sides}$$

Interior angle in regular polygons

$$= \frac{(\text{number of sides} - 2) \times 180^\circ}{\text{number of sides}}$$