Angles

We often use Greek letters to represent angles

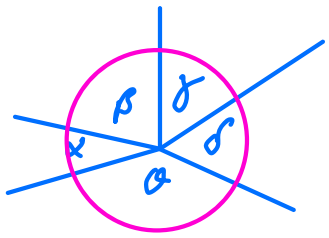
α	alpha
β	beta
γ	gamma
δ	delta
θ	theta
ϕ	phi

Angle in a full circle $= 360^\circ$

Scientific calculators can also measure angles in Grads (full circle = 400 grads) and in Radians (full circle = 2π radians)

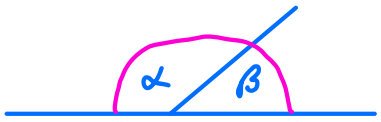
GCSE will only require the use of degrees.

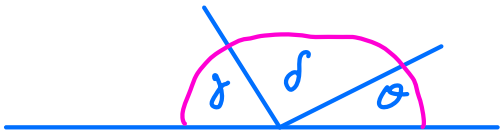
Properties



Angles at a point sum to 360°

$\alpha + \beta + \gamma + \delta + \theta = 360^\circ$

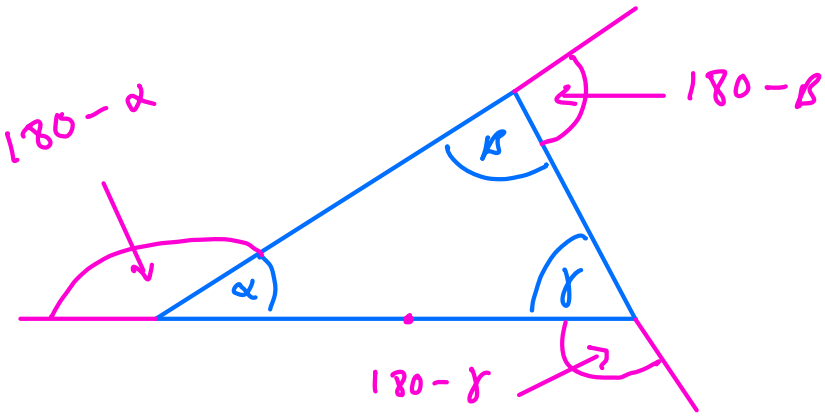




Angles on a straight line sum to 180°

$\alpha + \beta = 180^\circ$ $\qquad$ $\gamma + \delta + \theta = 180^\circ$

Angles of a Triangle sum to 180°



Let any triangle have angles α, β, γ

Three clockwise turns at each vertex of the triangle constitute a turn through a full circles

$\therefore$ (Therefore)

$$180 - \alpha + 180 - \beta + 180 - \gamma = 360^\circ$$

$$180 + 180 + 180 - 360 = \alpha + \beta + \gamma$$

$$180^\circ = \alpha + \beta + \gamma$$

Conclusion: The angles of any triangle sum to 180°

Polygons

A polygon is a planar closed shape made from straight line segments.

If all line segments are the same length and all angles are the same size, a polygon

is said to be regular. Otherwise it is irregular.

See Fact Sheet For Regular Polygons

Regular Polygons

Sides	Name	Exterior Angle	Interior Angle
3	Triangle	120°	60°
4	Quadrilateral	90°	90°
5	Pentagon	72°	108°
6	Hexagon	60°	120°
7	Heptagon	51.4°	128.6°
8	Octagon	45°	135°
9	Nonagon	40°	140°
10	Decagon	36°	144°

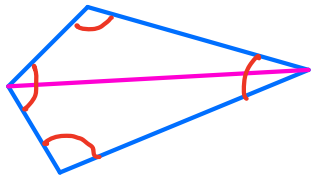
The exterior angle of a regular n-sided polygon $= \frac{360}{n}°$

The interior angle = 180° − exterior angle

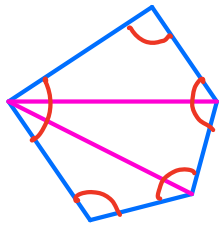
Interior Angles of a Polygon

Triangle sum to 180°

Quadrilateral sum t $2 \times 180° = 360°$

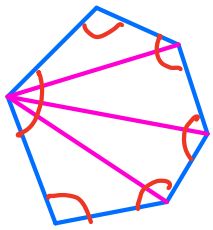


Pentagon



sum to $3 \times 180^\circ = 540^\circ$

Hexagon



sum to $4 \times 180^\circ = 720^\circ$

n-sided polygon

sum to $(n-2) \times 180^\circ$
