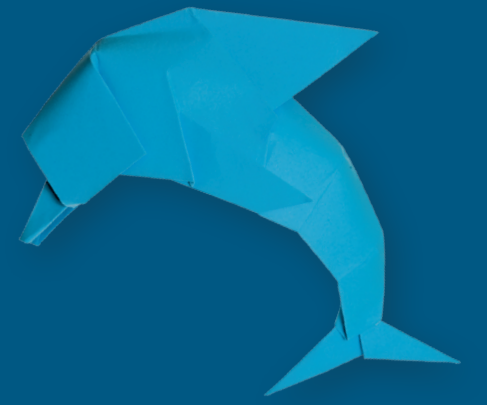
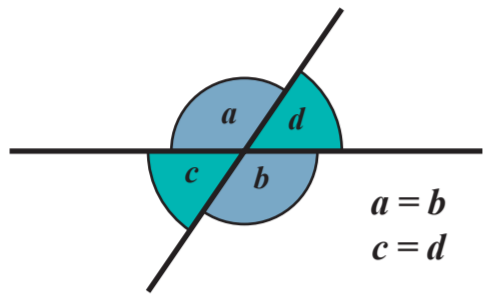


# GCSE (9-1) Mathematics

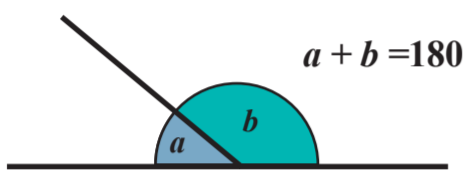
## Geometrical Reasoning



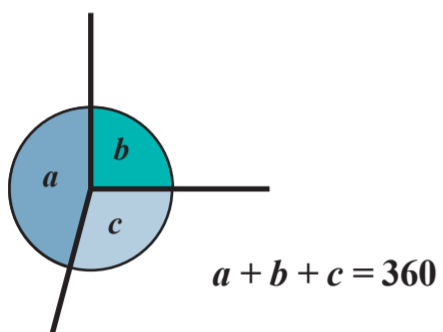
### Lines



Vertically opposite angles are equal

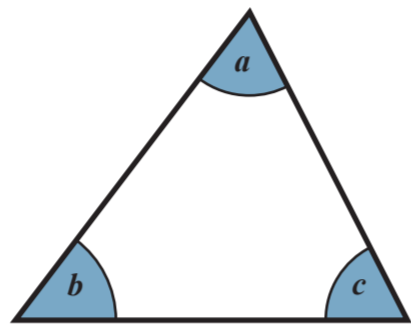


Angles on a straight line add up to 180



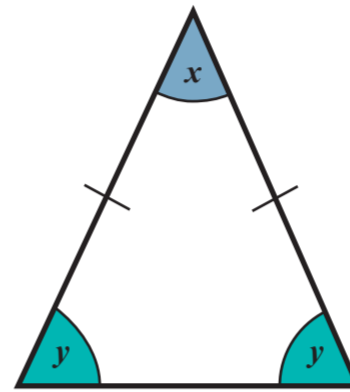
Angles at a point add up to 360

### Triangles

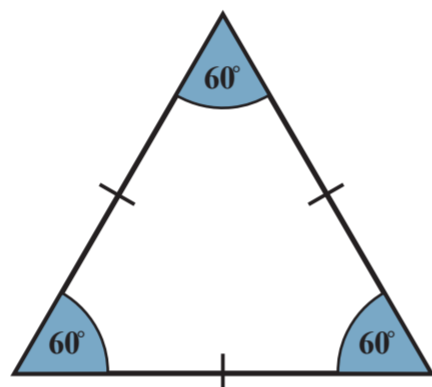


$$a + b + c = 180$$

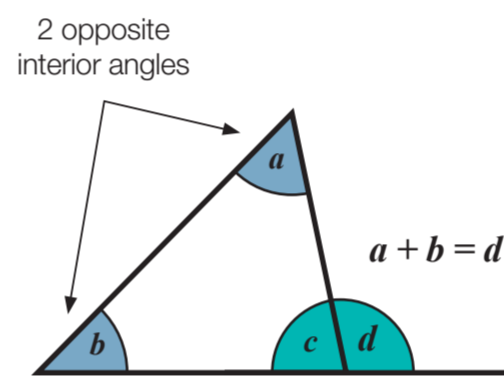
Angles in a triangle add up to 180



Base angles of an isosceles triangle are equal



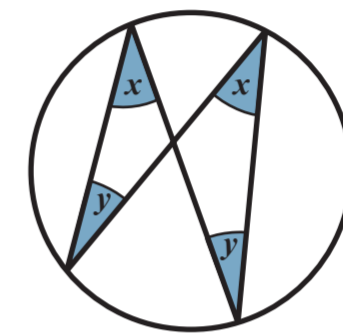
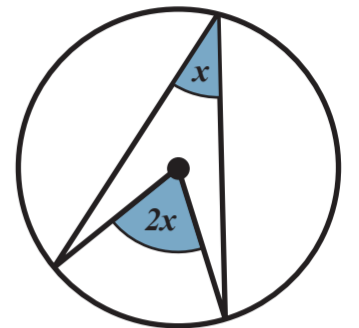
Angles in an equilateral triangle are equal



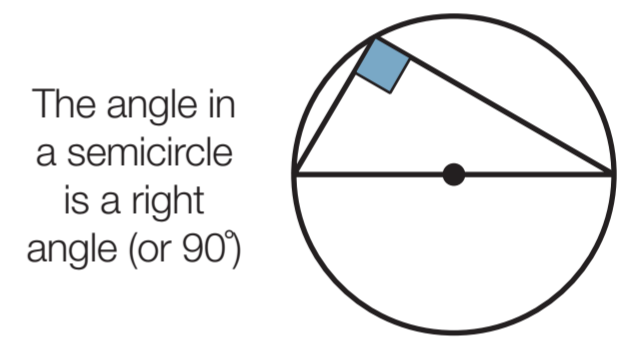
An exterior angle (of a triangle) is equal to the sum of the interior opposite angles

### Circle Theorems

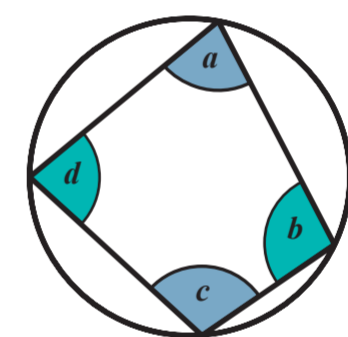
The angle at the centre of a circle is twice the angle at the circumference



Angles in the same segment are equal



The angle in a semicircle is a right angle (or  $90^\circ$ )

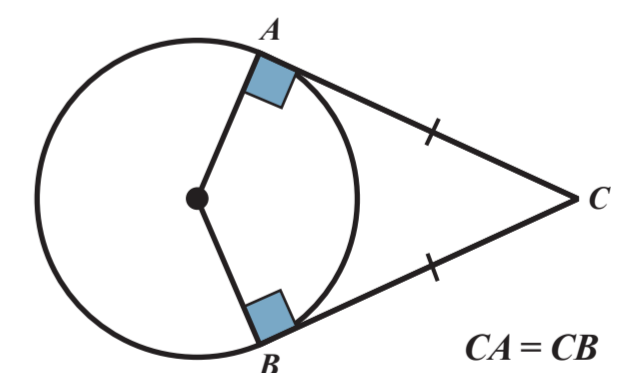
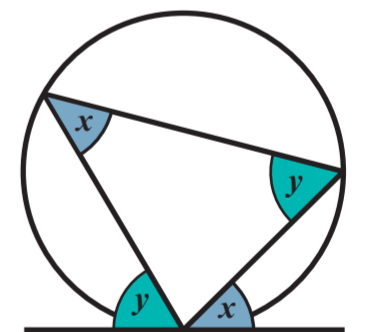


Opposite angles in a cyclic quadrilateral add to 180

$$a + c = 180$$

$$b + d = 180$$

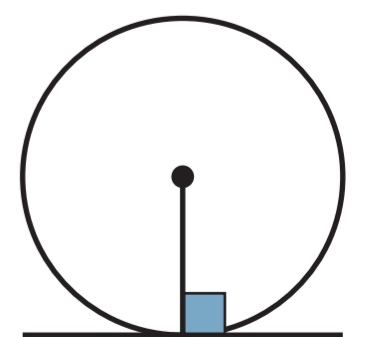
Alternate segment theorem



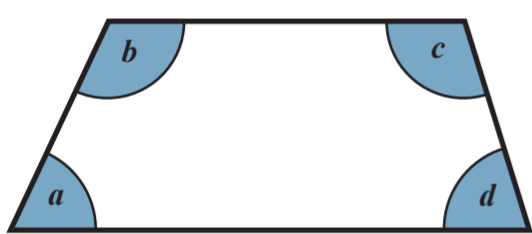
$$CA = CB$$

Tangents to a circle from an external point are equal in length

A tangent to a circle is perpendicular (or  $90^\circ$ ) to the radius.



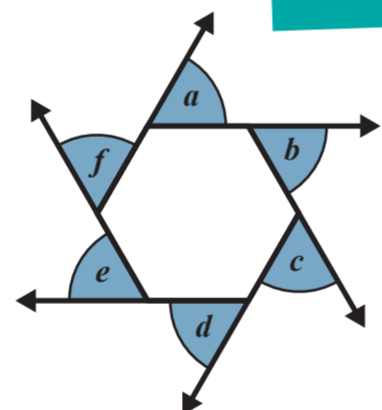
### Quadrilaterals



$$a + b + c + d = 360$$

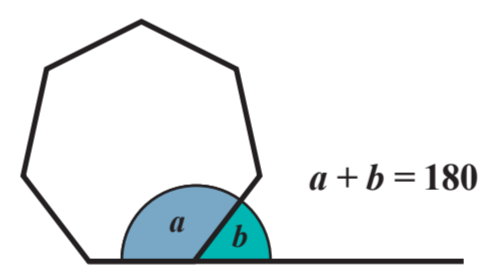
Angles in a quadrilateral add up to 360

### Polygons



$$a + b + c + d + e + f = 360$$

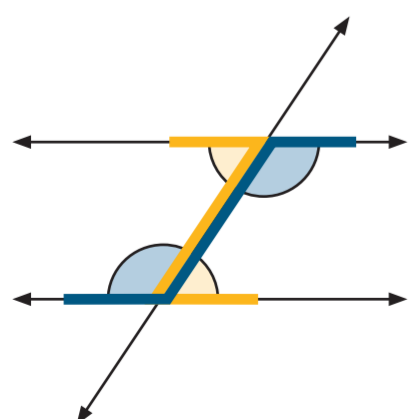
Exterior angles of a polygon add up to 360



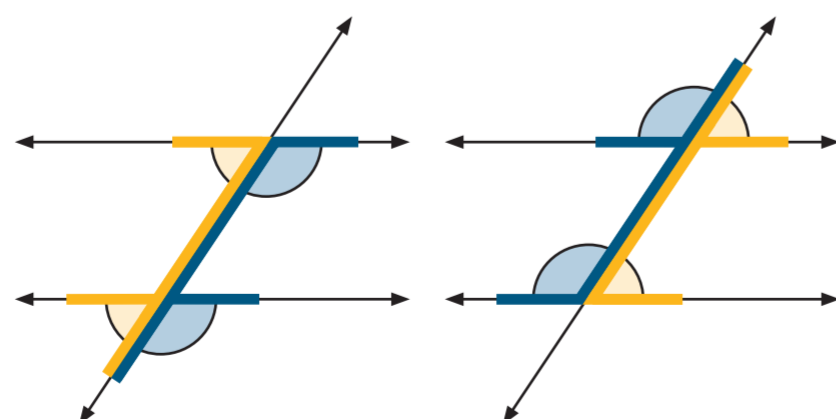
$$a + b = 180$$

The interior and exterior angle of any polygon add up to 180

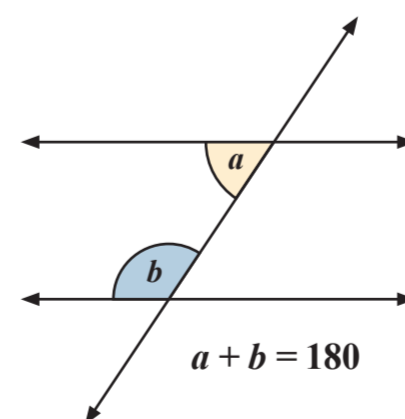
### Parallel lines



Alternate angles are equal



Corresponding angles are equal



Allied (or co-interior) angles add up to 180