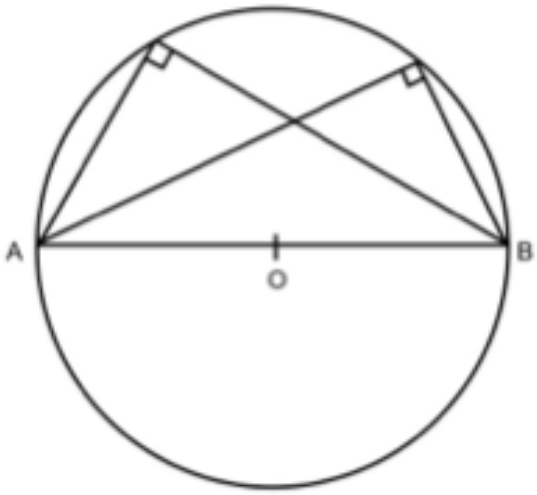
Circle Theorems

Angle in a semicircle equals 90°

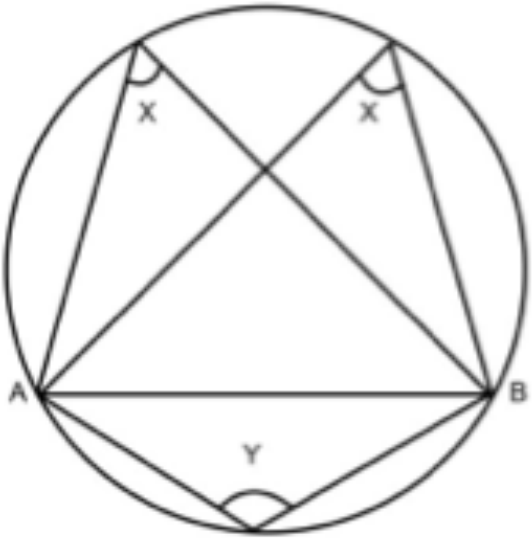
A triangle drawn from the two ends of a diameter (AB) will ALWAYS make an angle of 90° at the edge of the circle, no matter where it touches the edge.



Angles in the same segment are equal

All triangles drawn from a chord AB in the same segment will make the same angle (X) where they touch the edge of the circle.

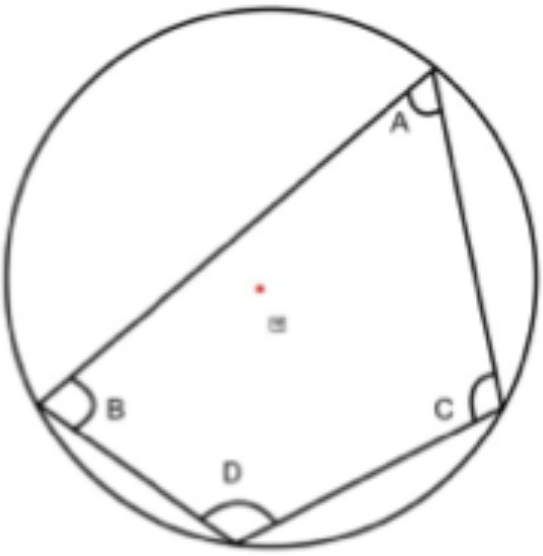
Also the two angles on opposite sides of the chord add up to 180° (X+Y= 180°)



Opposite sides of a cyclic quadrilateral add up to 180°

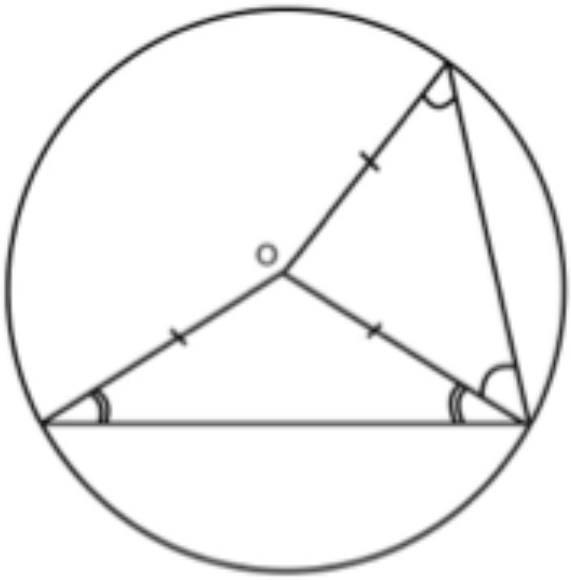
A *cyclic quadrilateral* is a 4 sided shape with every corner touching at the circle.

Both pairs of angles add up to 180° i.e. A+D=180° and B+C=180°



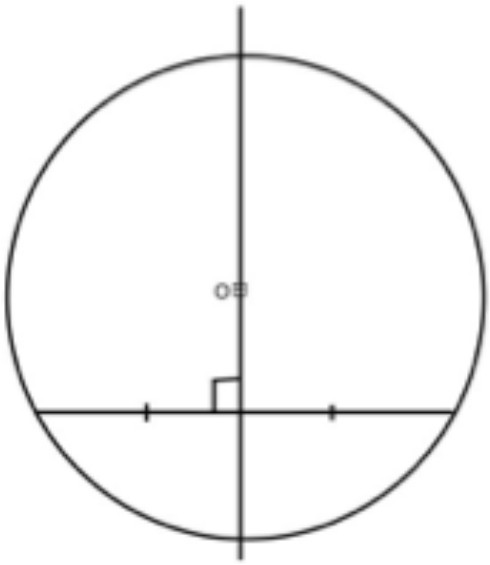
Isosceles triangle formed by two radii

If a triangle includes two radii, then it's isosceles



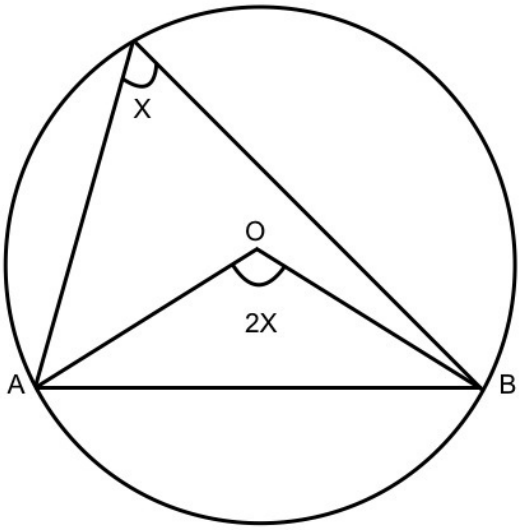
A chord bisector is a diameter

A chord is any line drawn across a circle, and no matter where you draw a chord, the line that cuts it directly in half at right angles is a diameter of the circle i.e. it goes right through the centre.



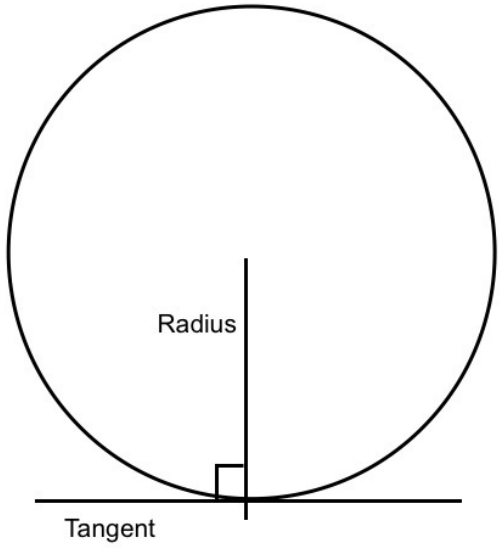
Angle at the centre is twice the angle at the edge

The angle subtended at the centre of a circle is DOUBLE the angle subtended at the edge of the circle from the same two points i.e. the two ends of the chord AB.



Tangent and radius meet at 90°

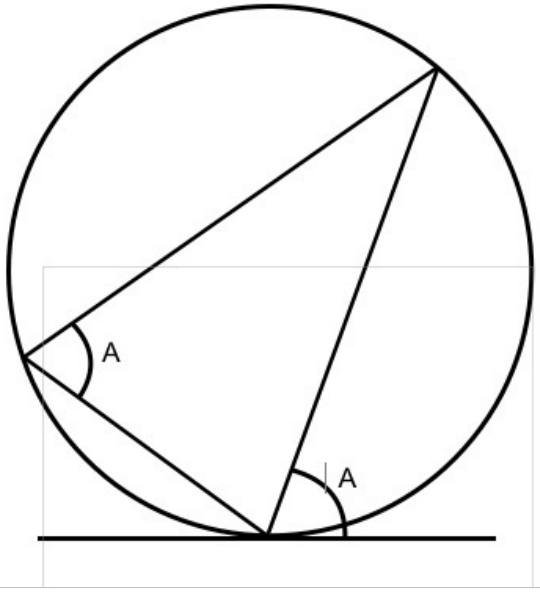
A tangent is a line that just touches the edge of a circle. If a tangent and a radius meet at the same point, then the angle they make is 90°.



Angle in the opposite segment is equal

If you draw a tangent and a chord that meet, then the angle between them is always equal to the angle in the opposite segment.

The diagram helps with this tricky theorem



Equality of tangents from a point

Two tangents drawn from any point outside the circle make two lines equal in length between the point and the circle, and therefore create two congruent right-angled triangles.