Circle Geometry

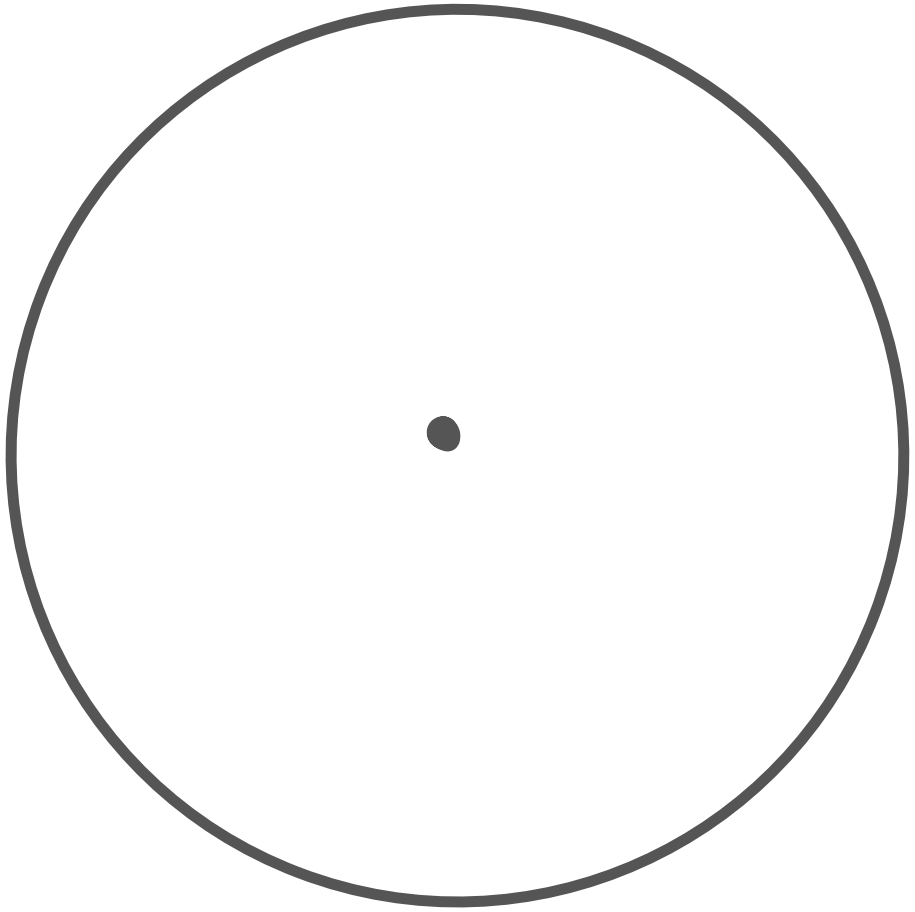
By .... Kru ซี่

⭐1. Circle theorems

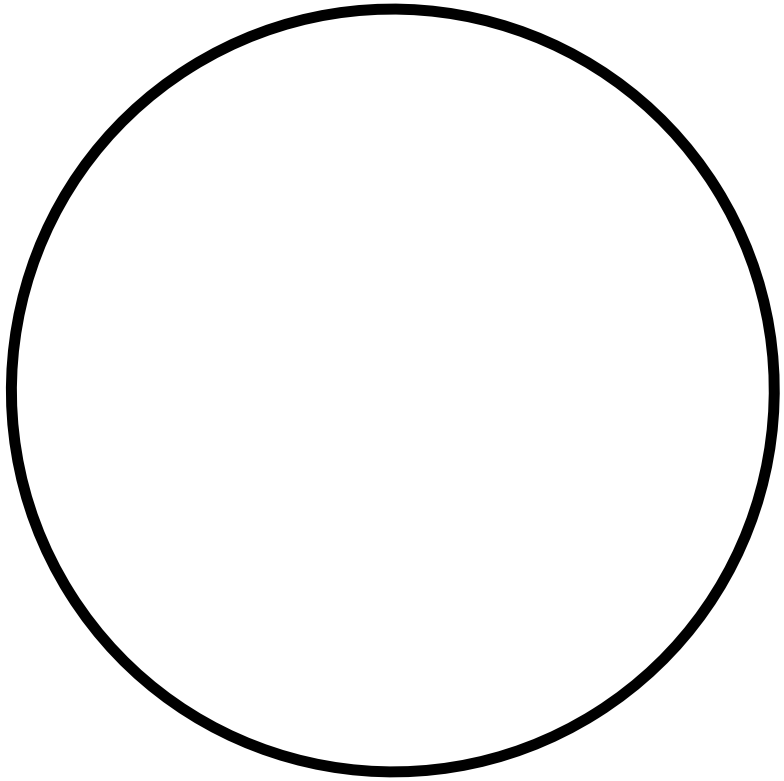
⭐2. Intersecting chords theorems

Circle theorems : Parts of circle

TOP Maths IGCSE

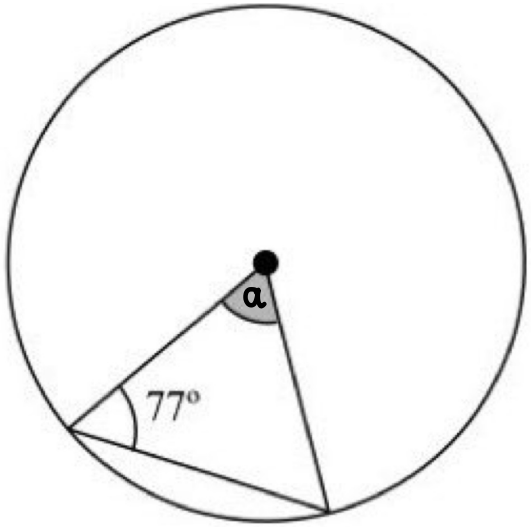


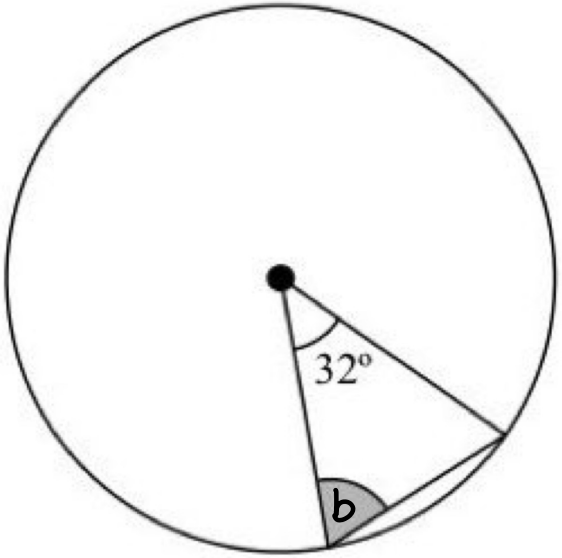
1. The isosceles triangle , when 2 sides are radius

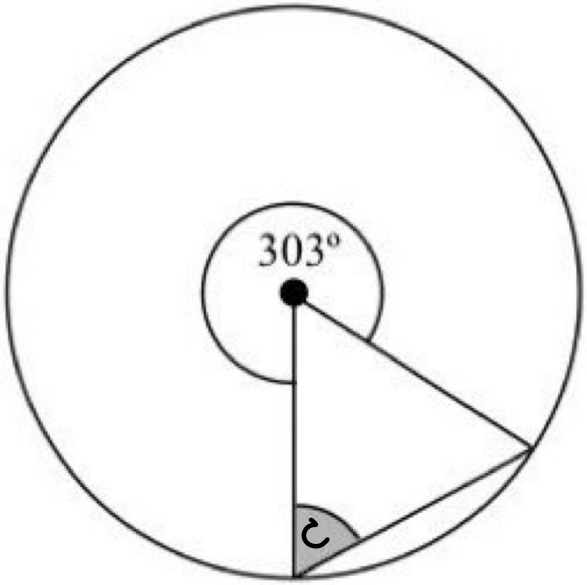


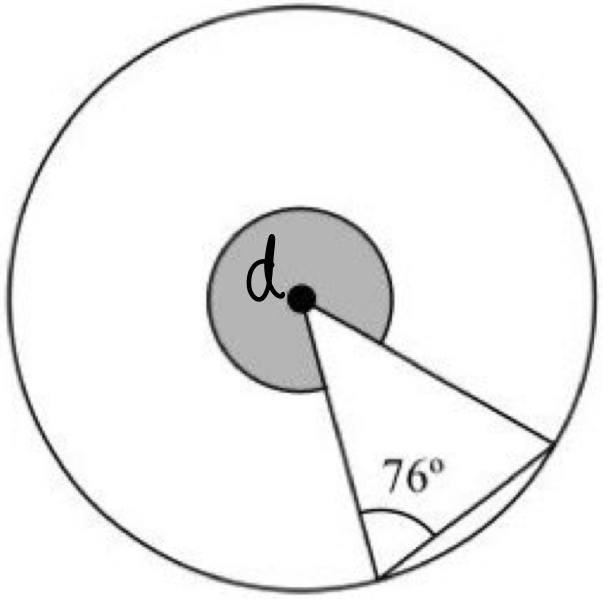
Circle theorems : exercise

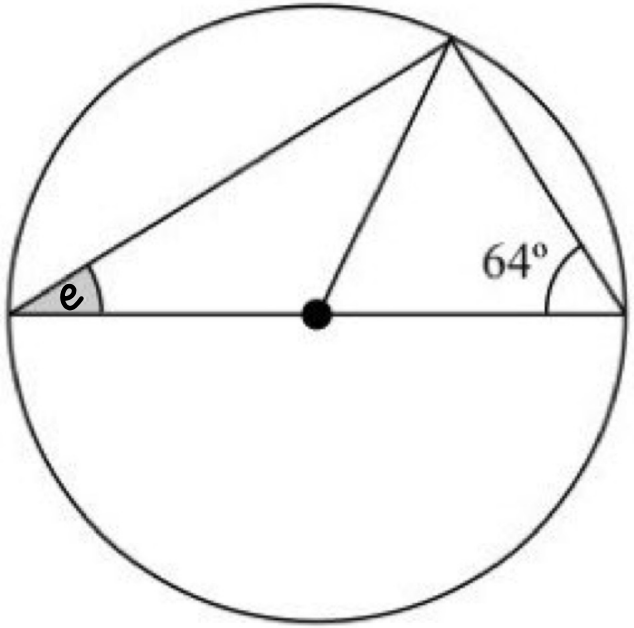
TOP Maths IGCSE



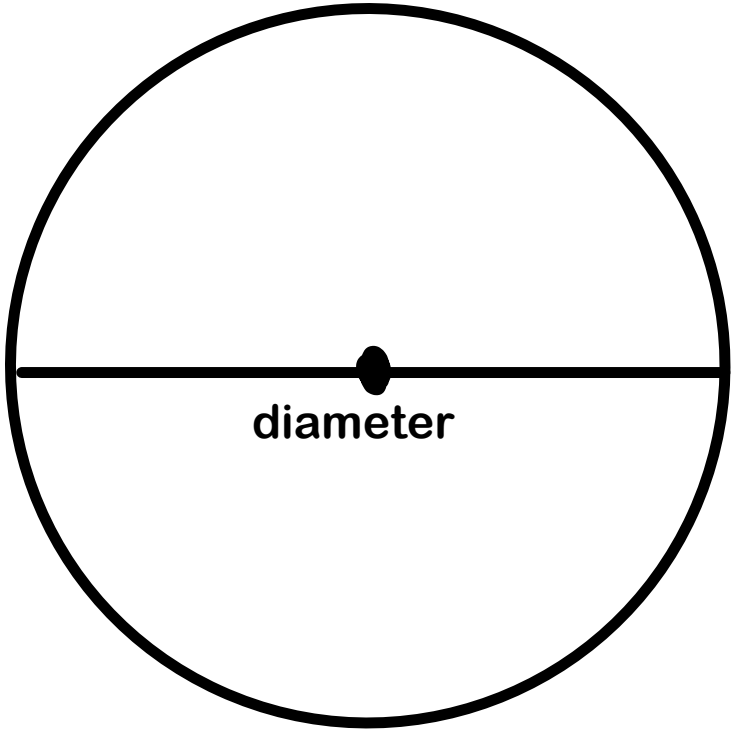




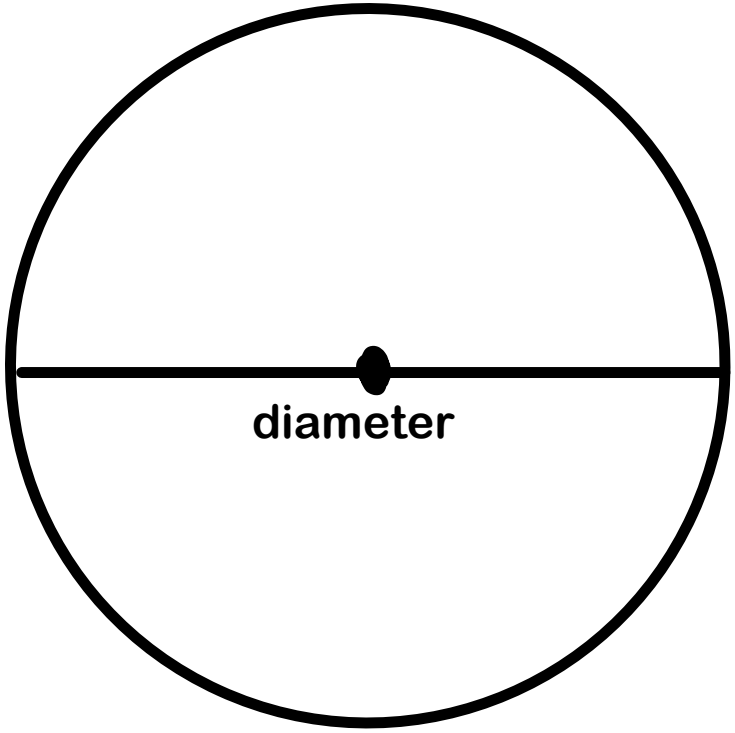




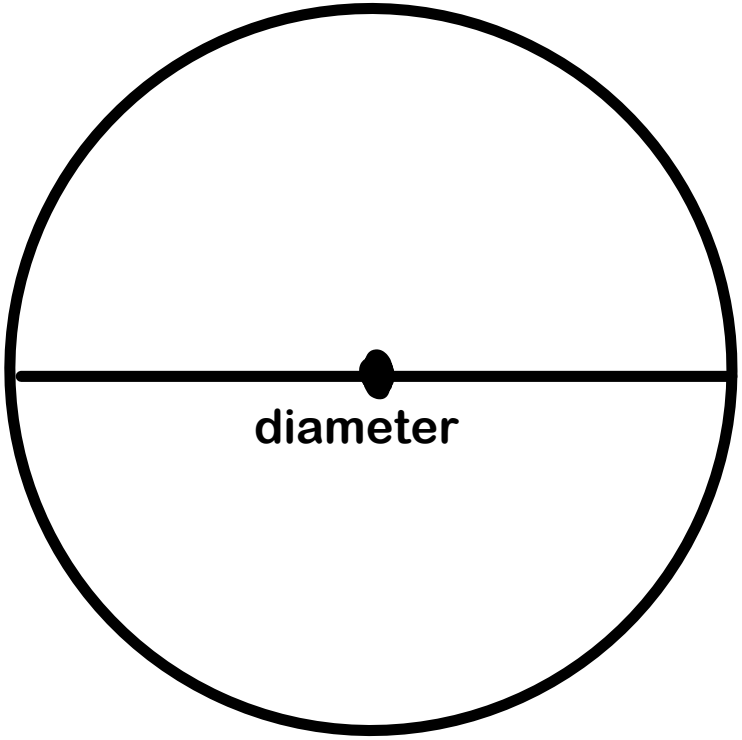
2. Angle in semicircle is 90°

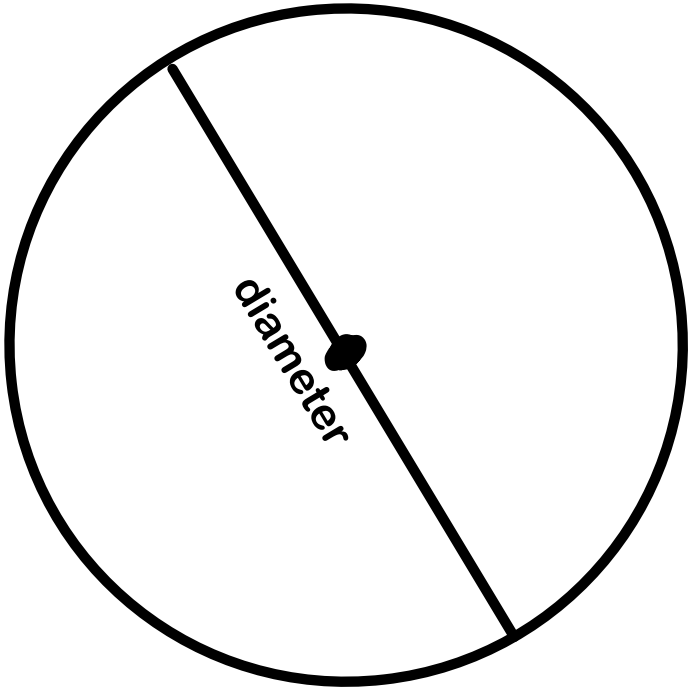


2. Angle in semicircle is 90°



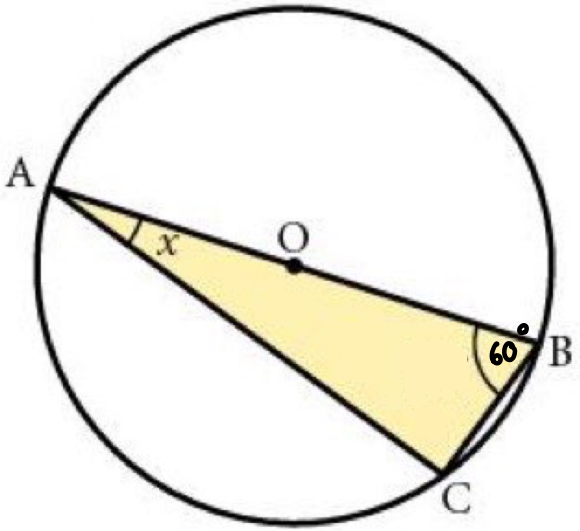
Why?

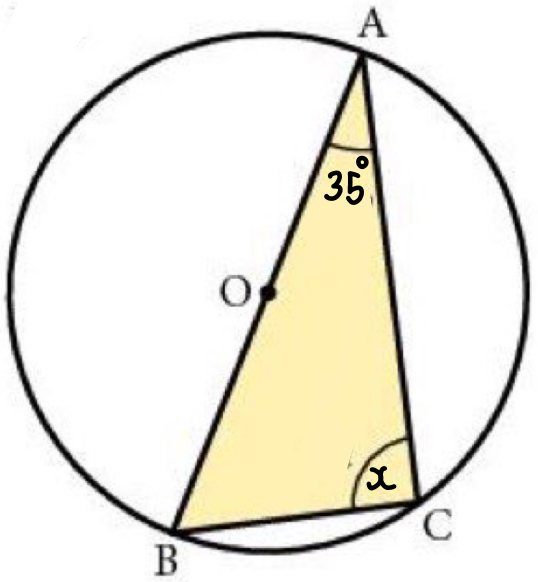

diameter

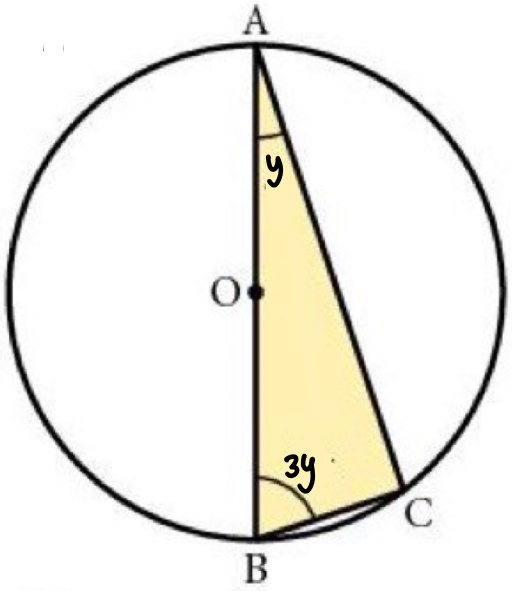

diameter

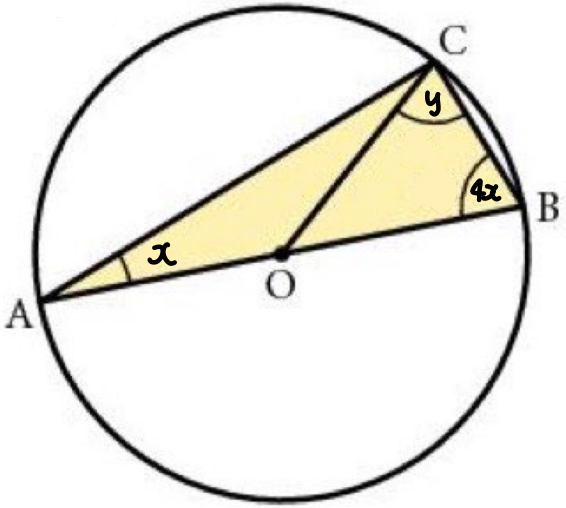
Circle theorems : Exercise

TOP Maths IGCSE

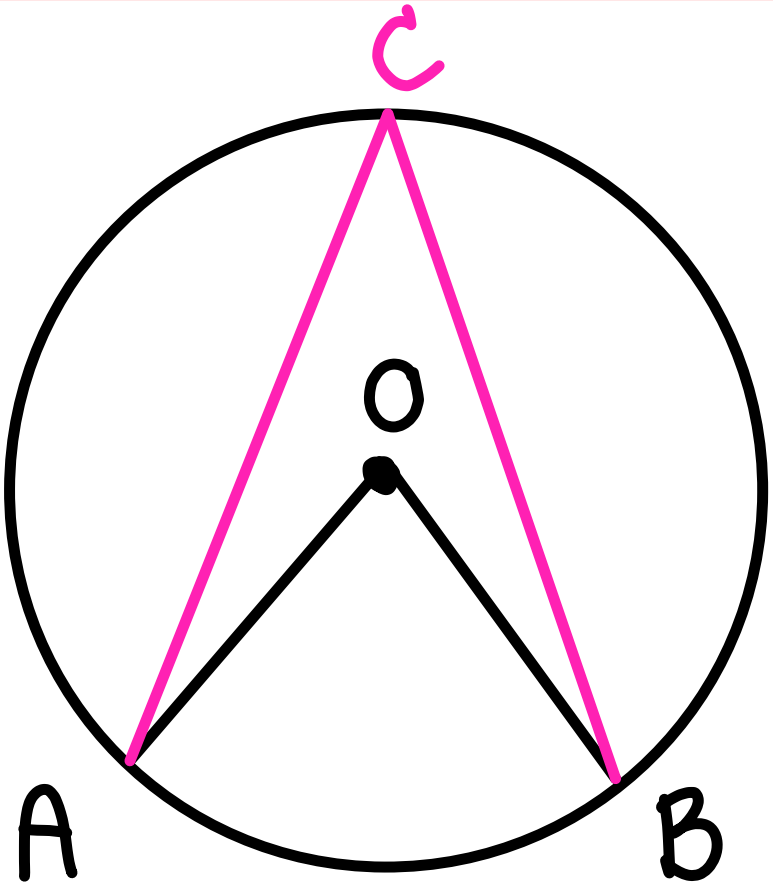


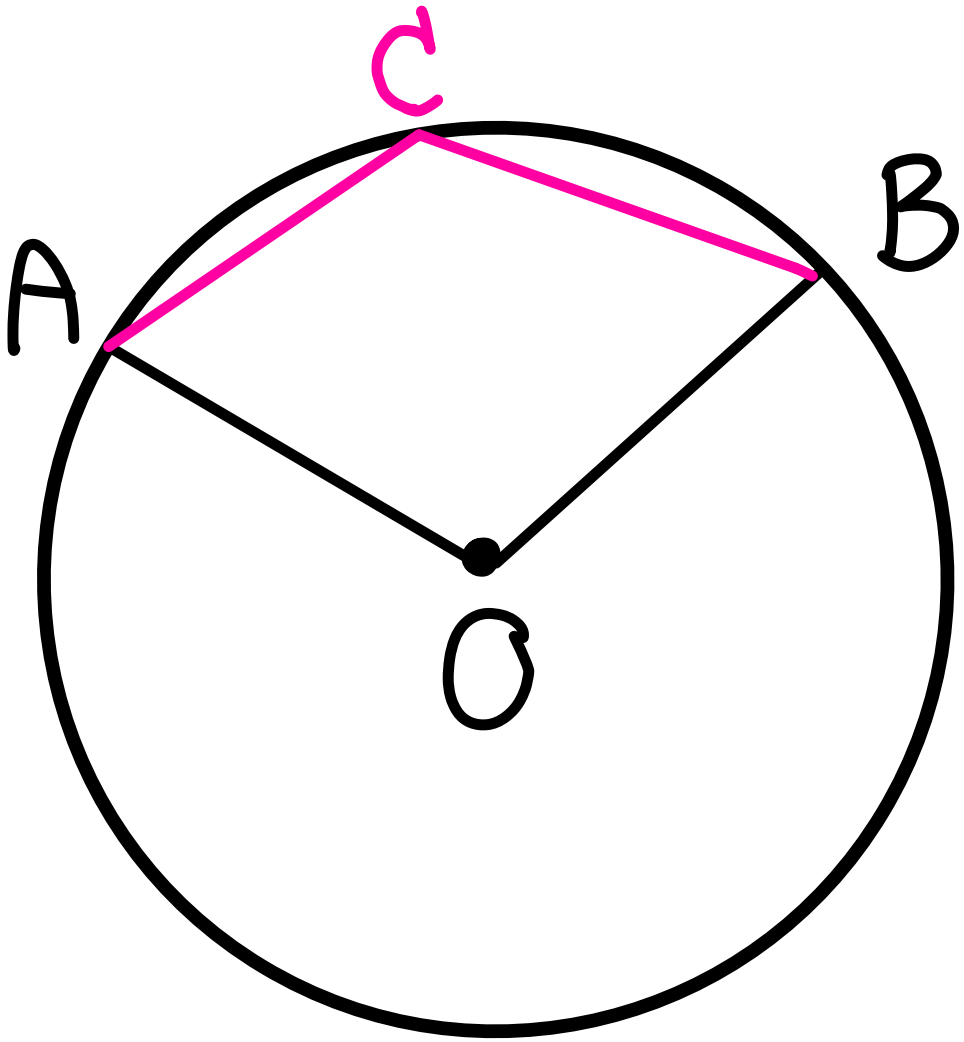






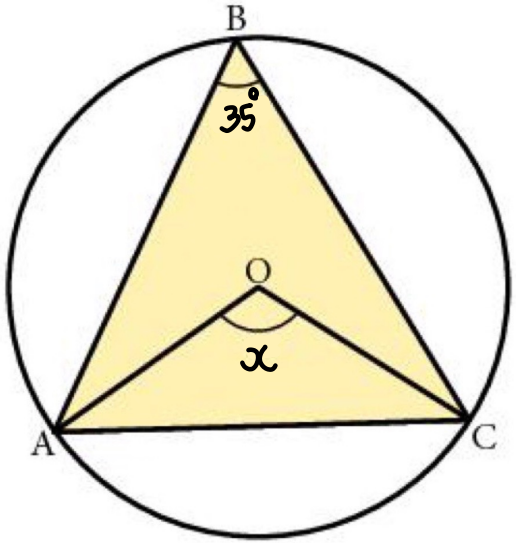
3. Angle at the centre is twice of angle at the circumference

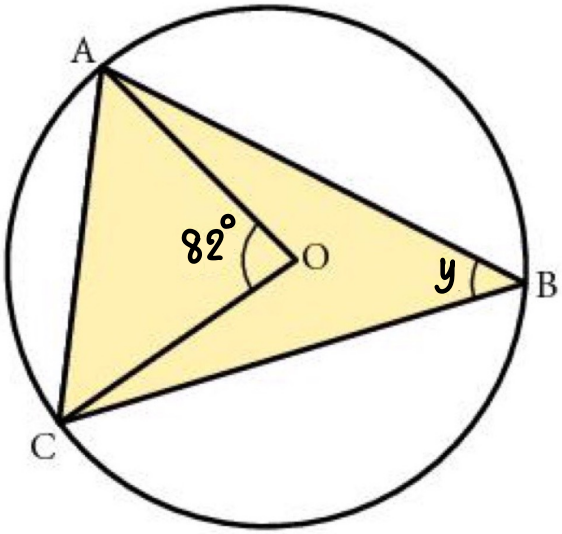


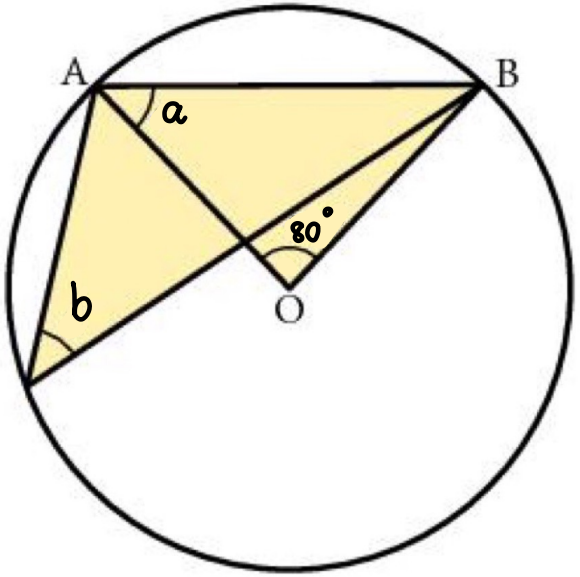

C
A
B
O

Circle theorems: Exercise

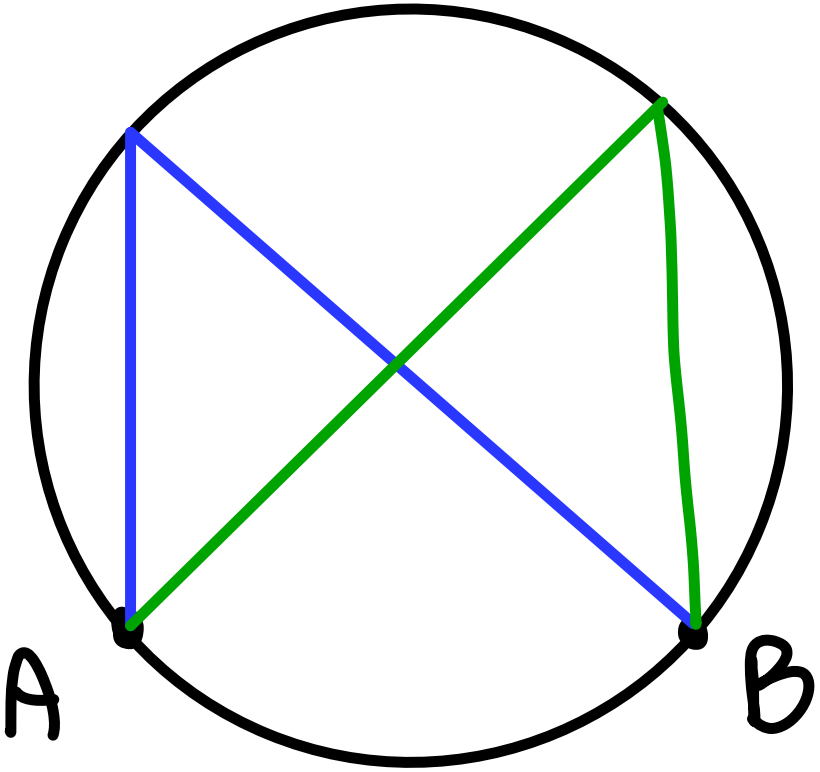
TOP Maths IGCSE

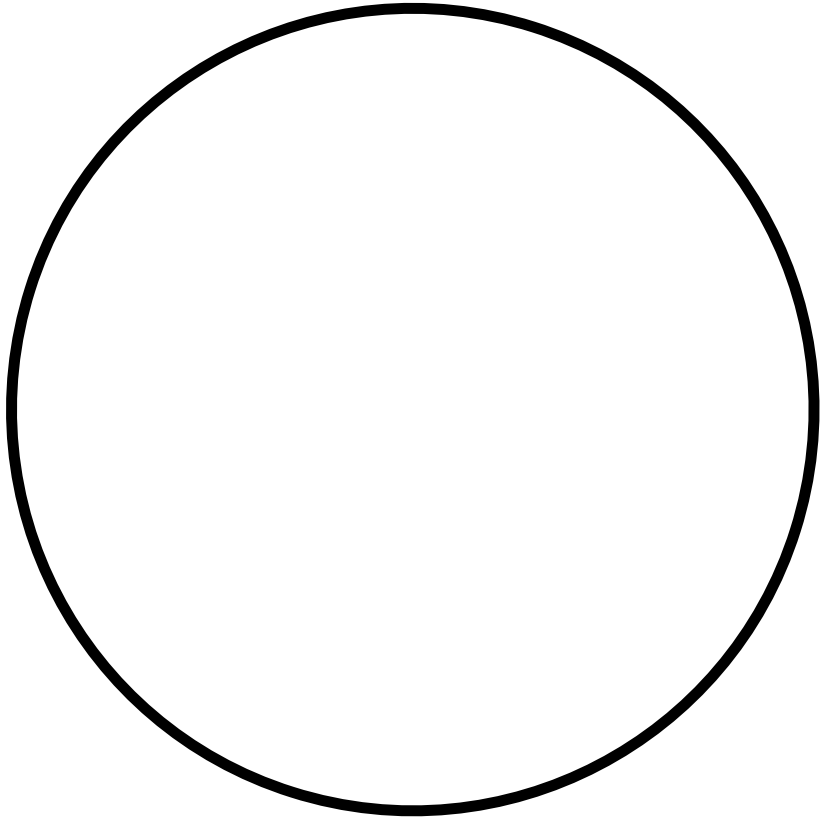


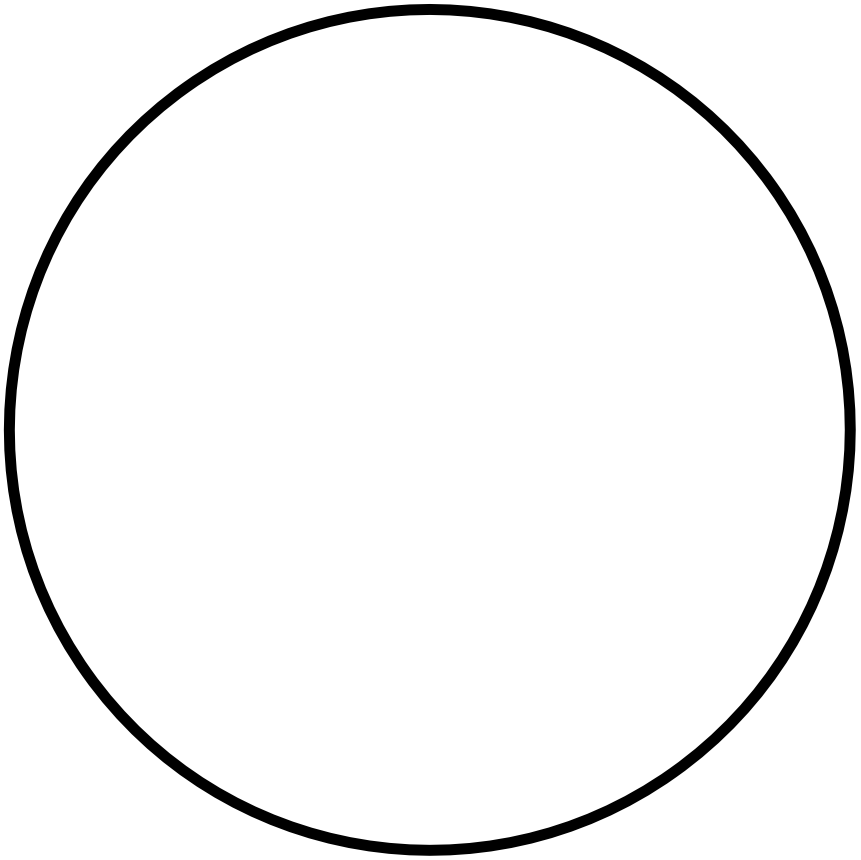




4. Angles in same segment are equal

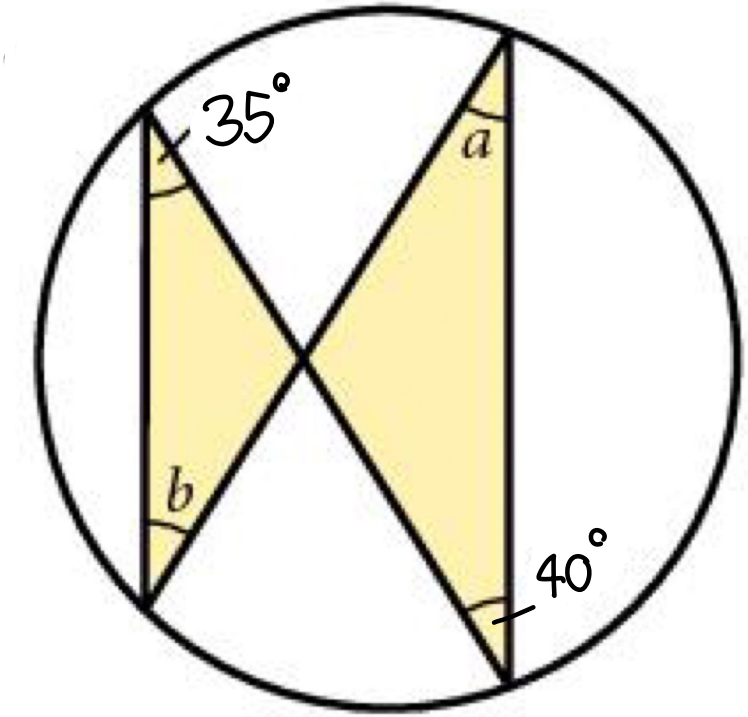


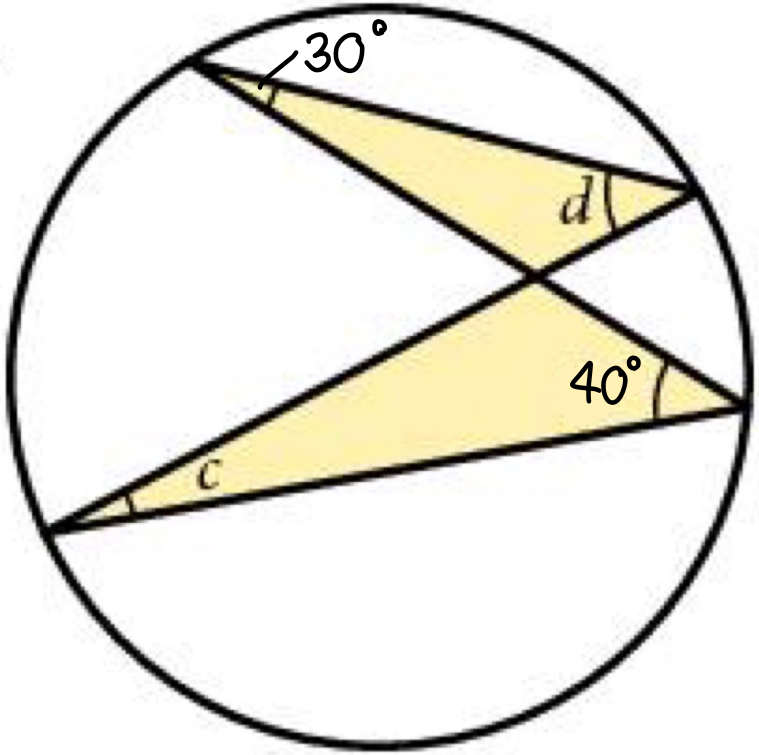


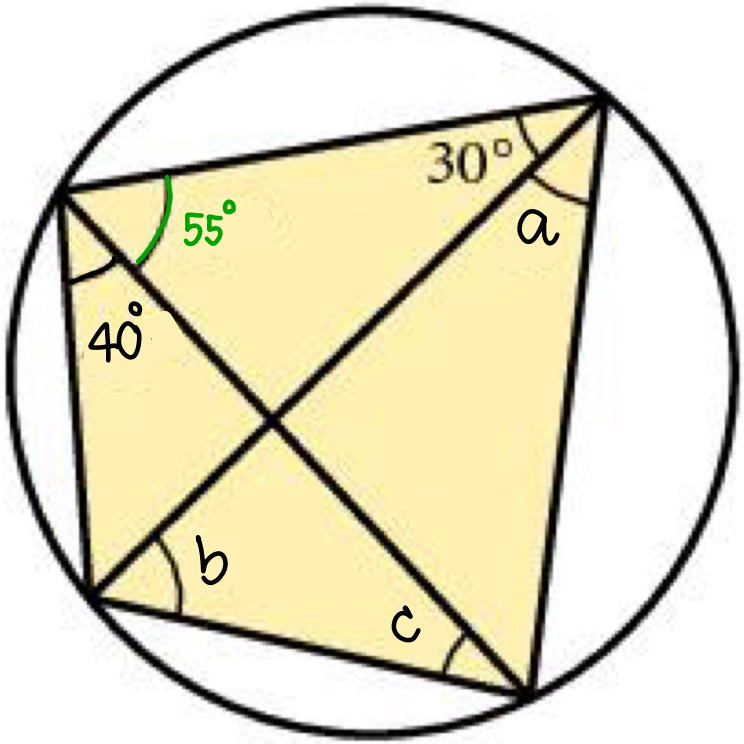


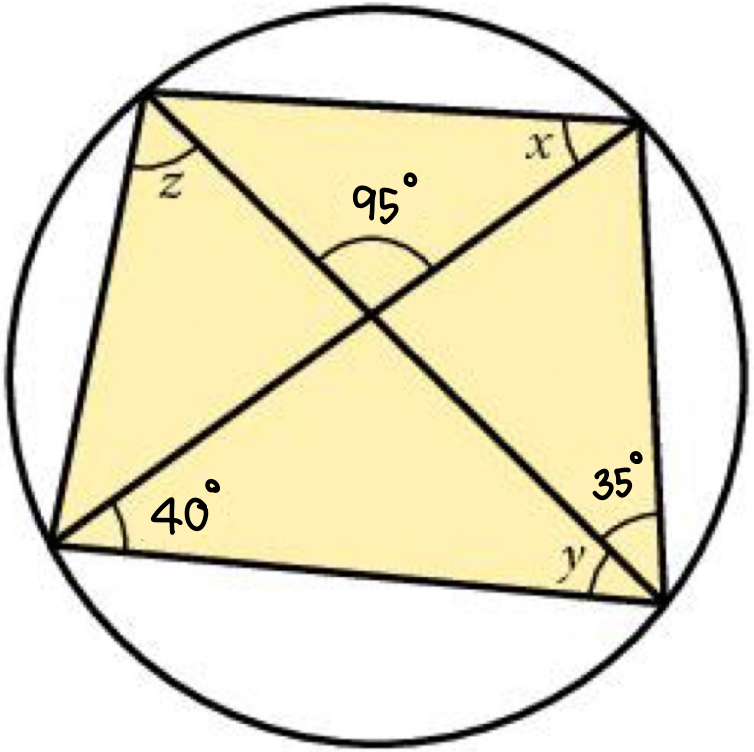
Circle theorems : Exercise

TOP Maths IGCSE

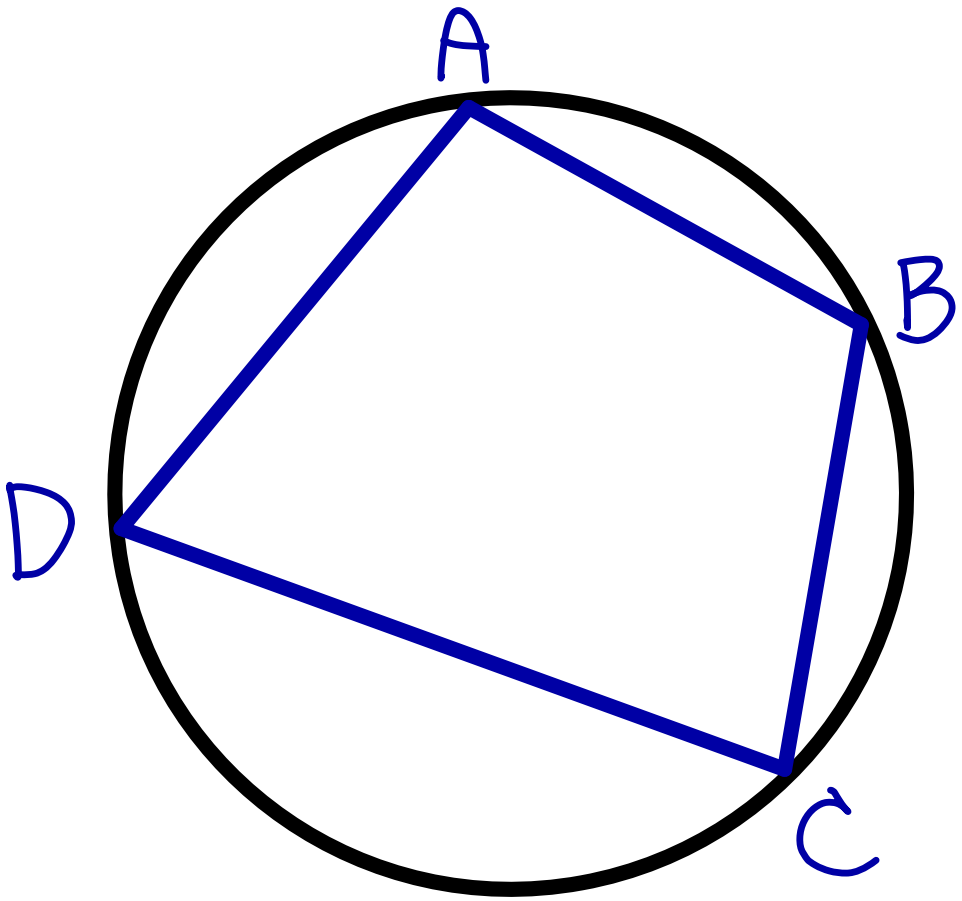


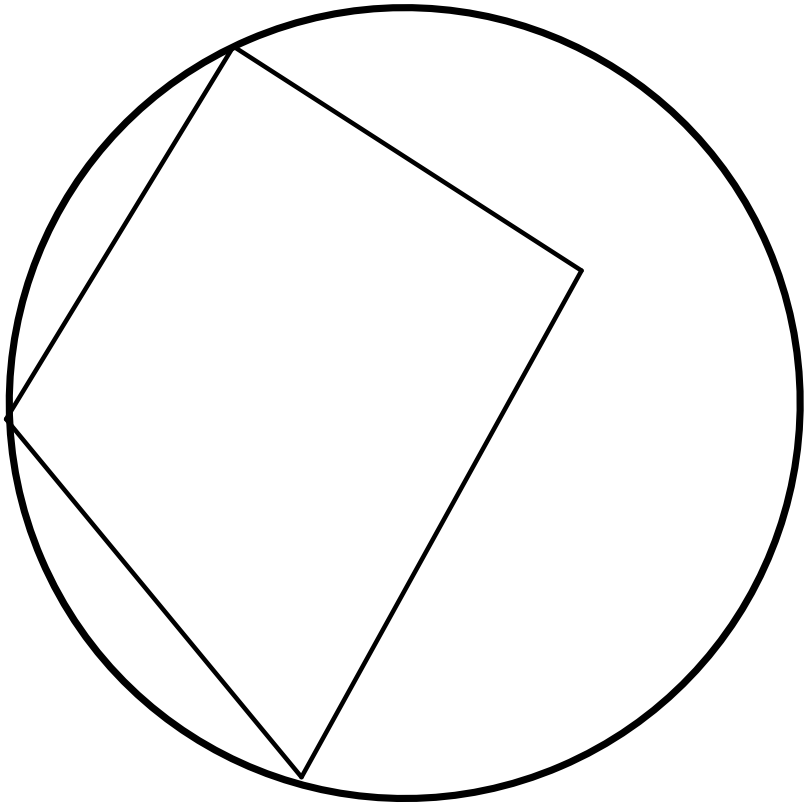



30°
55°
a
40°
b
c

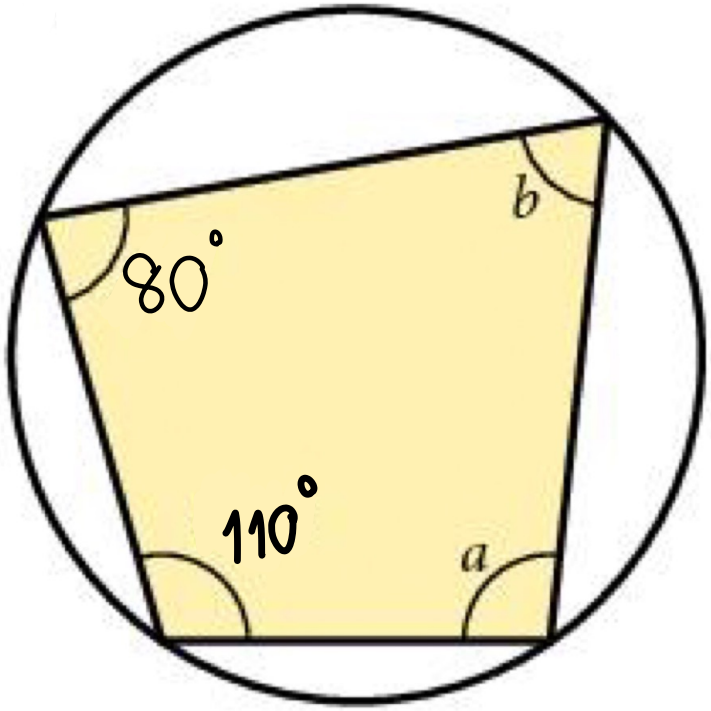

z
x
95°
40°
35°
y

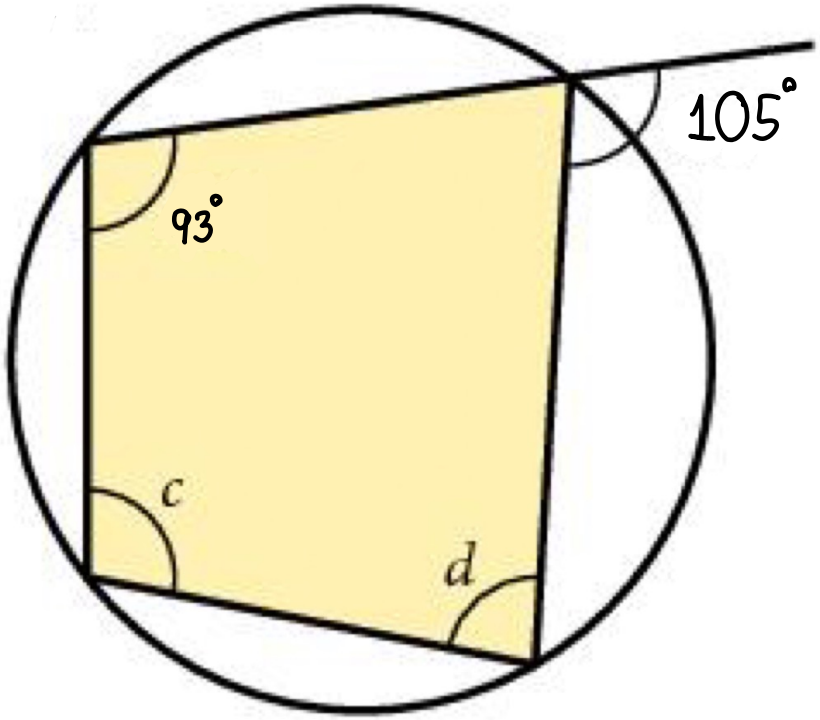
5. Opposite angles in cyclic quadrilateral add up to 180°





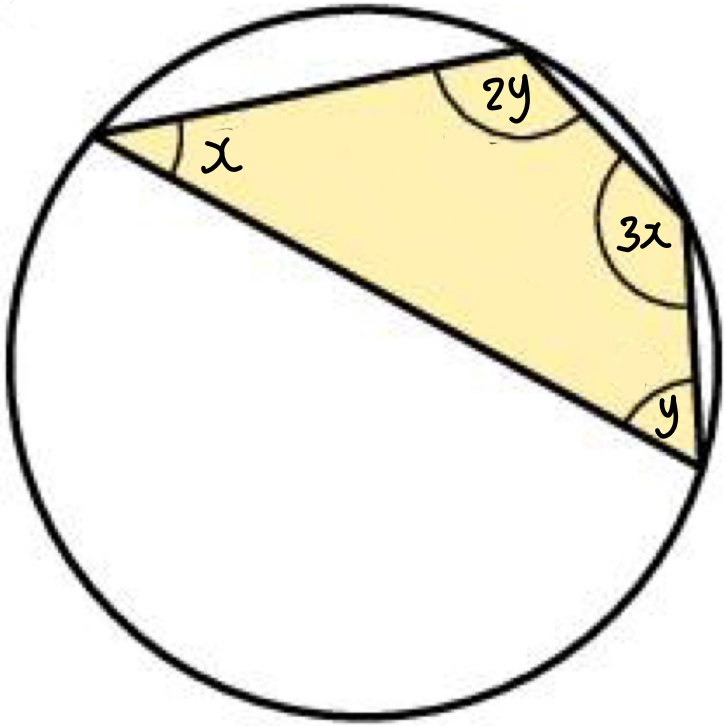
Not cyclic quadrilateral !

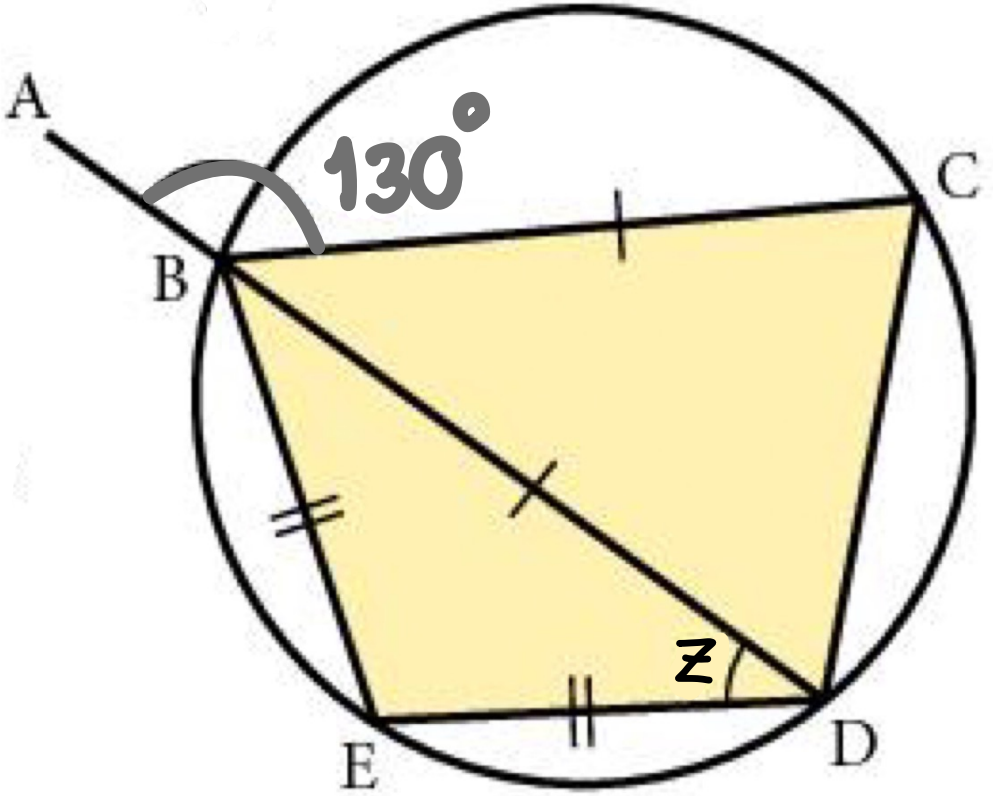

80°
b
110°
a


105°
93°
c
d

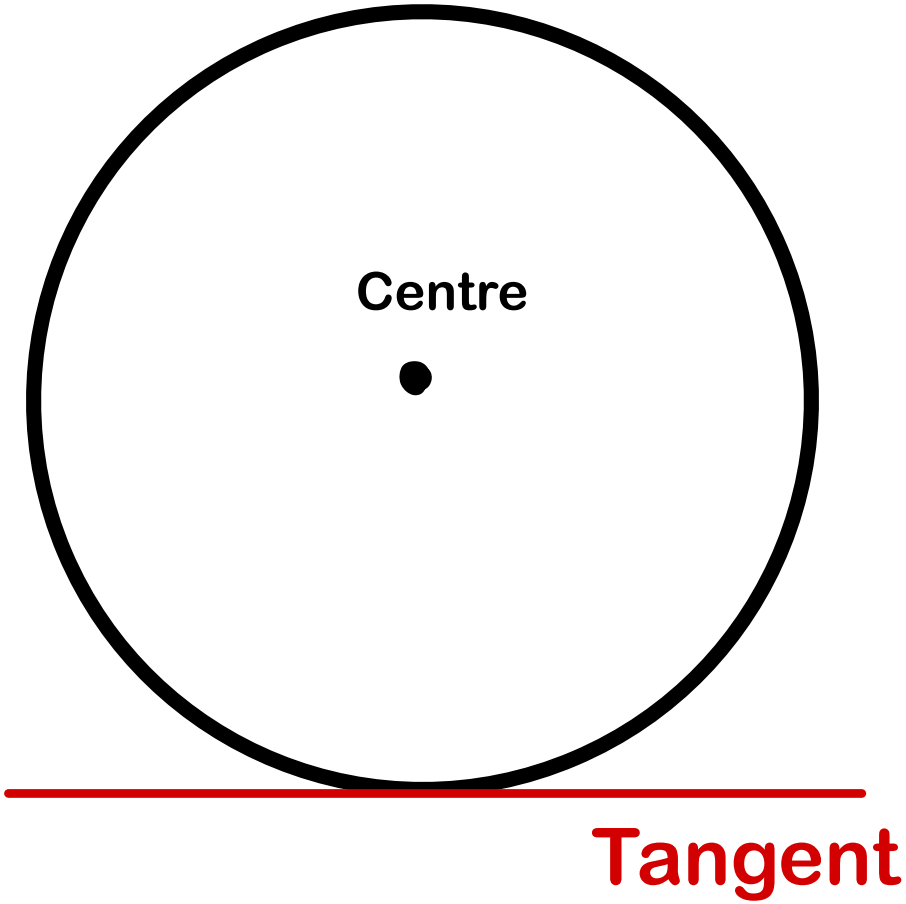
Circle theorems: Exercise

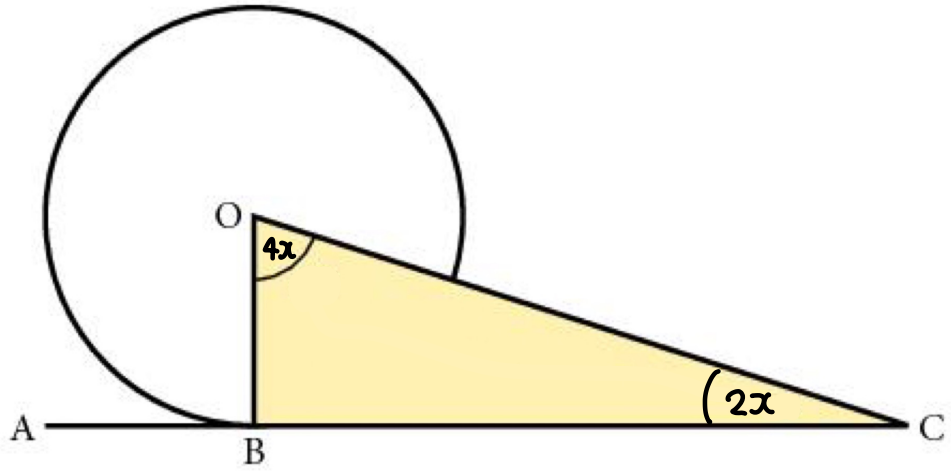
TOP Maths IGCSE

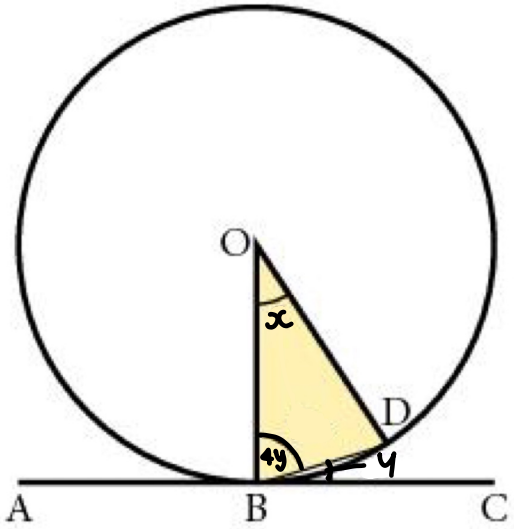




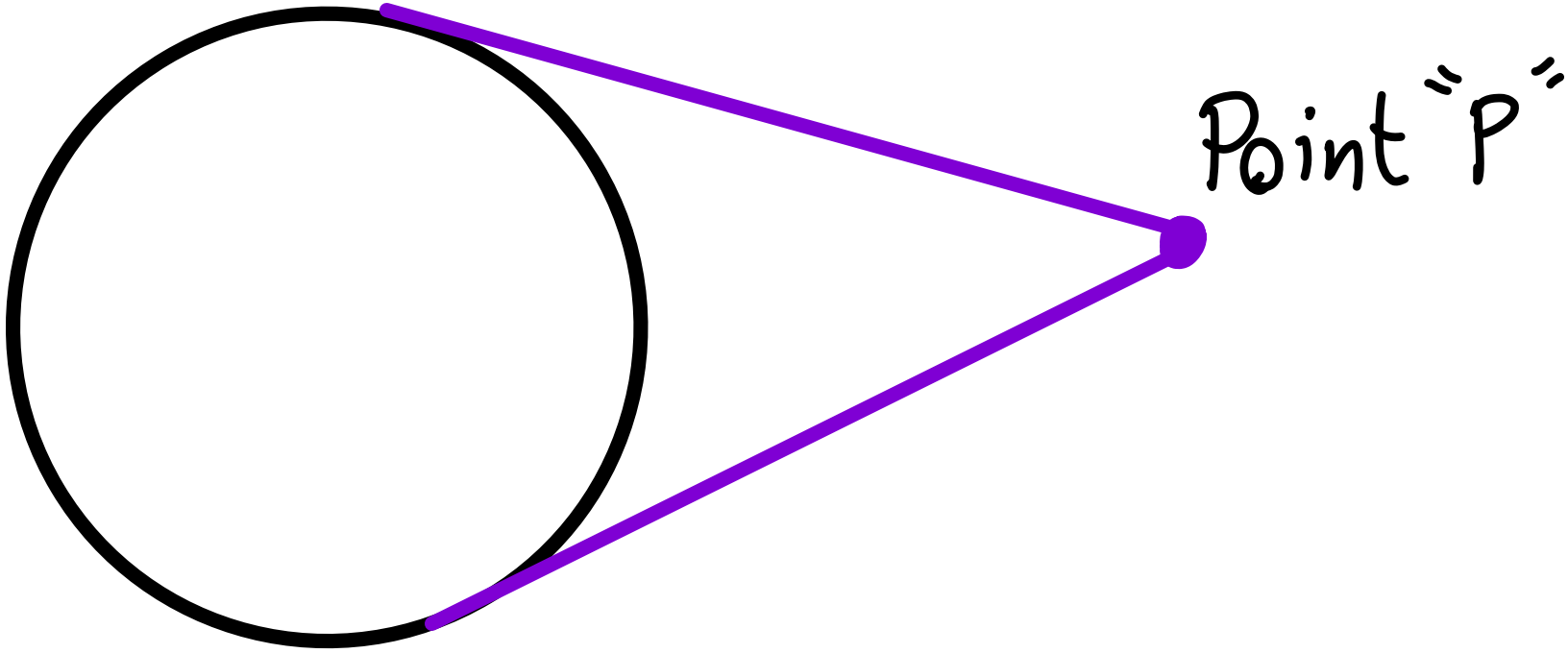
6. Angle between radius and tangent is 90°

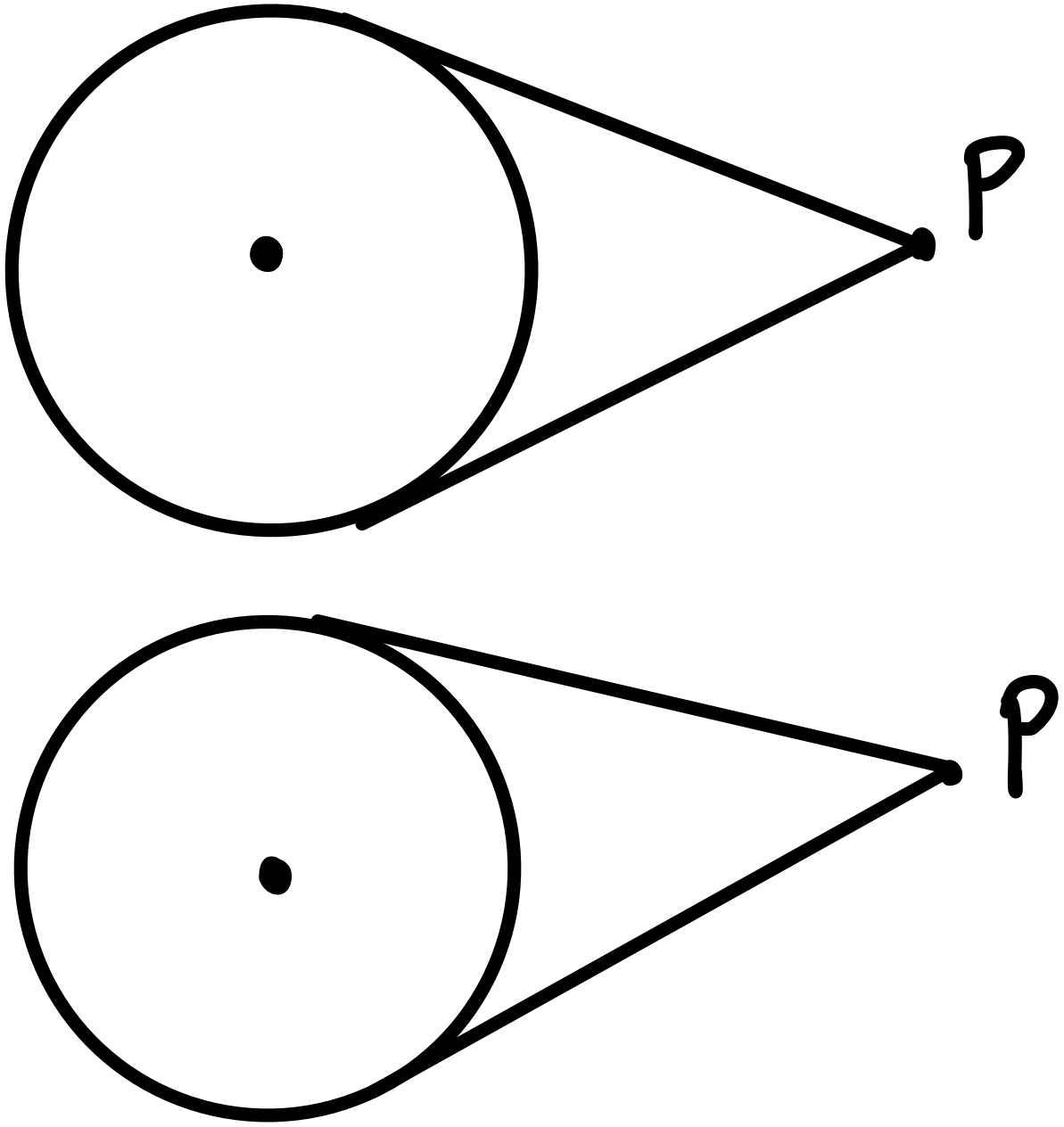



O
4x
2x
A
B
C


O
x
D
4y
y
A
B
C

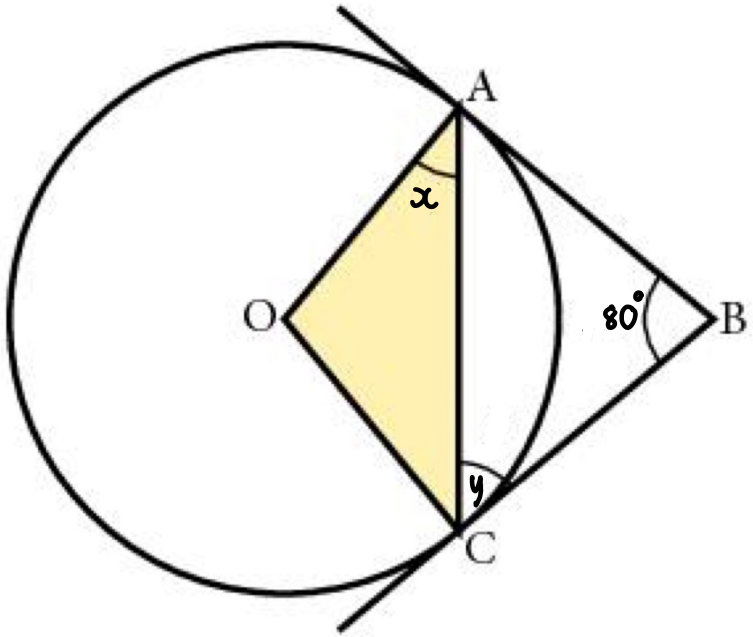
7. The tangents from the point outside circle are equal in length

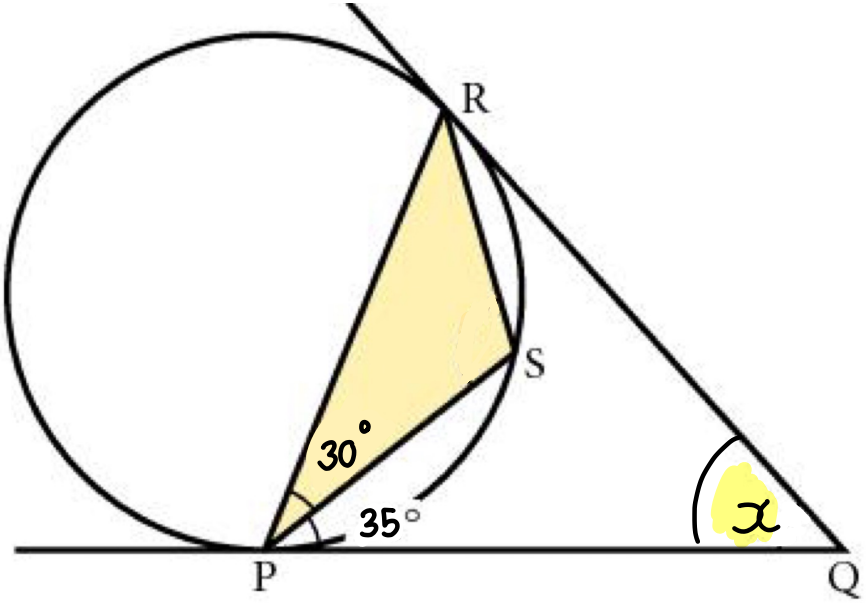



P
P

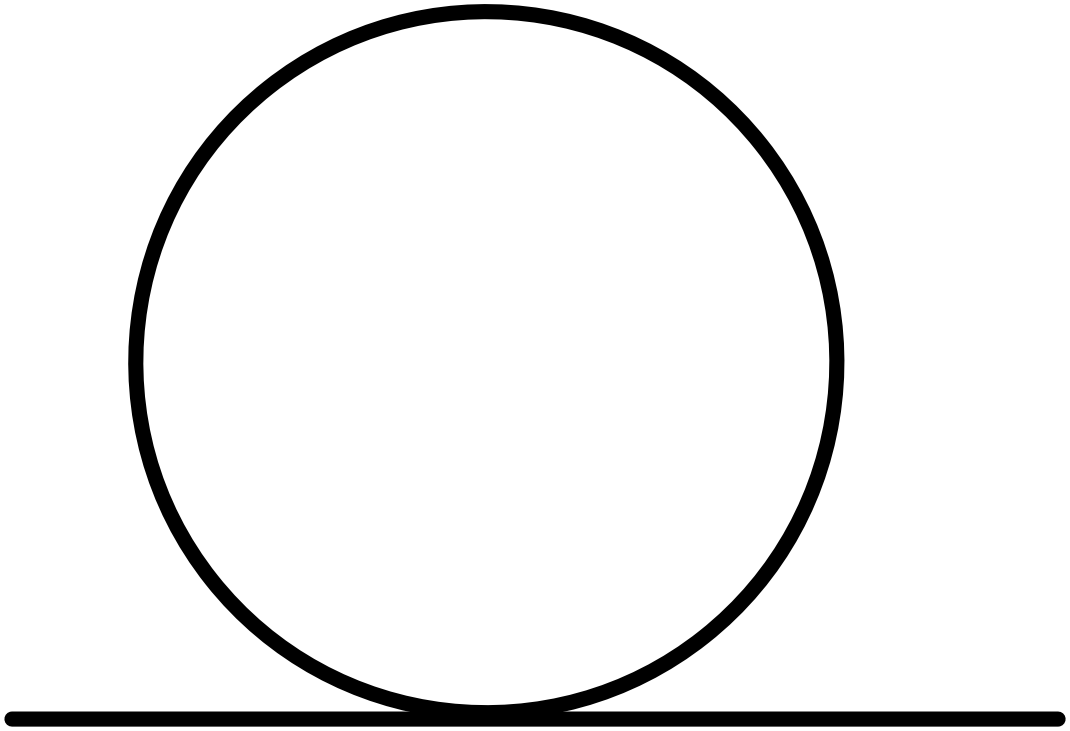
Circle theorems: Exercise

TOP Maths IGCSE

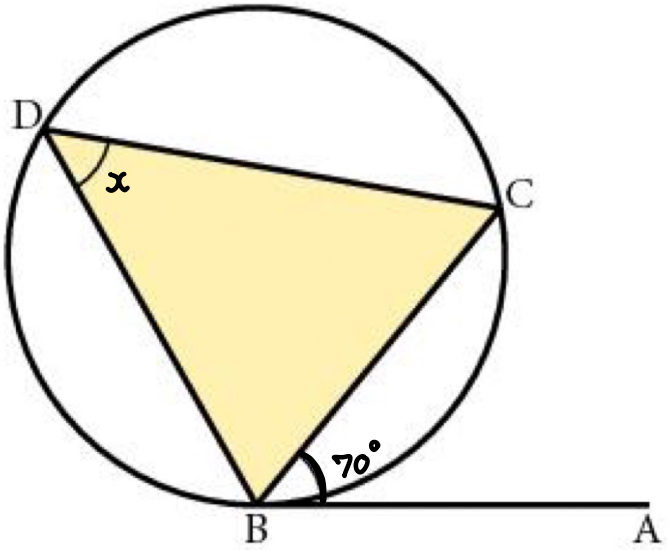


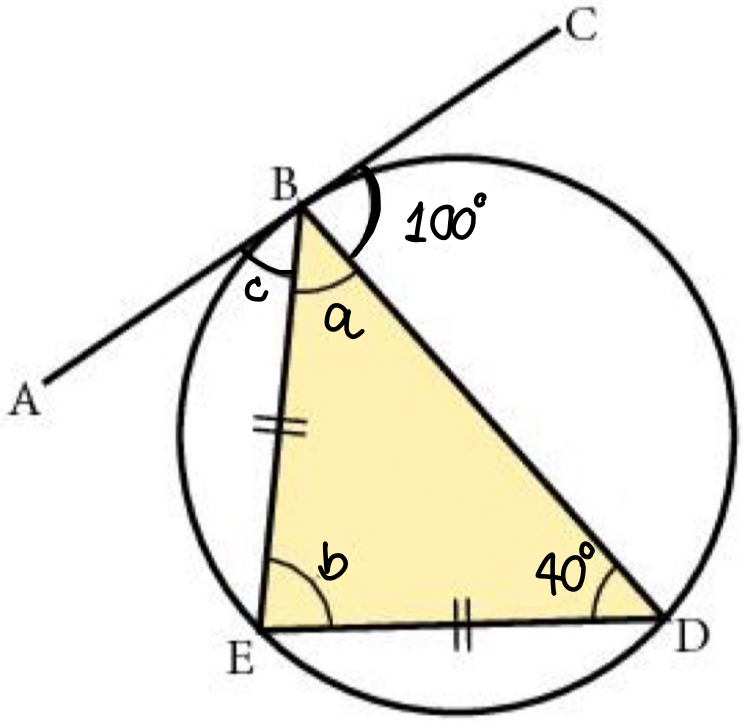


8. Alternate segment theorem

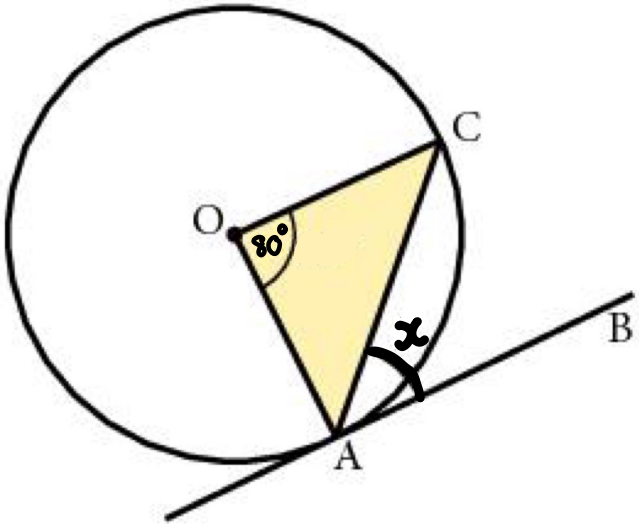


Tangent

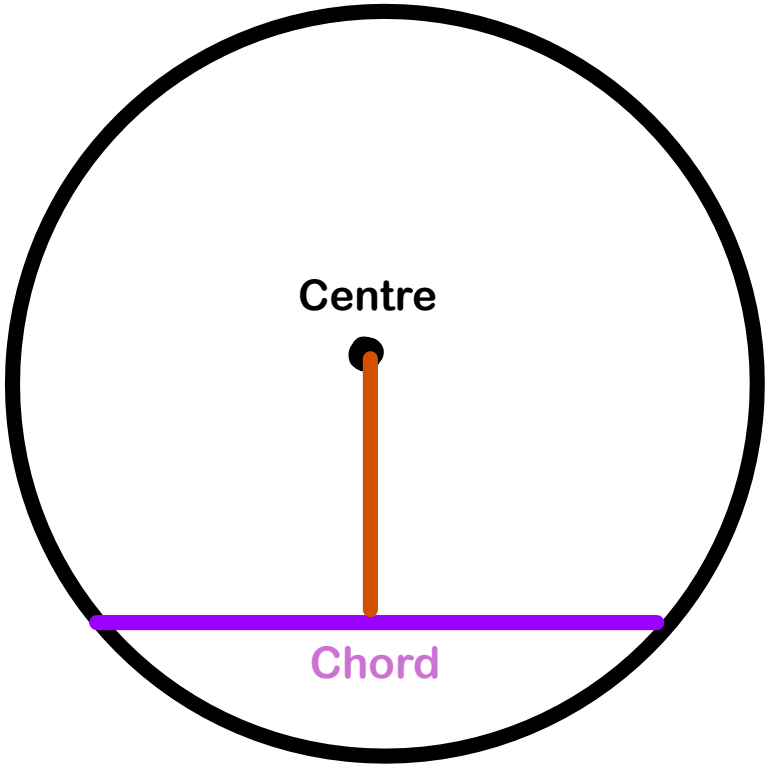


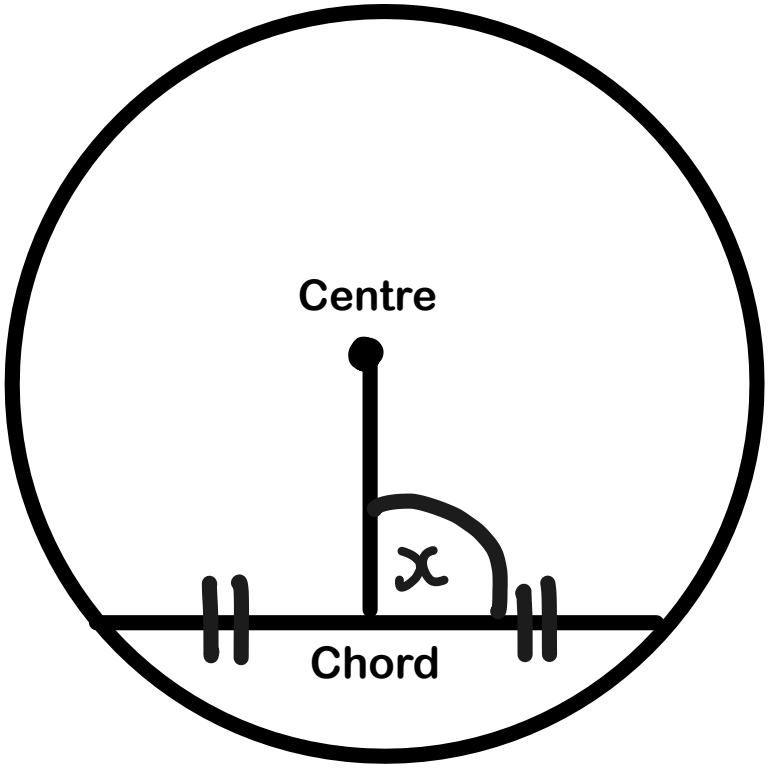


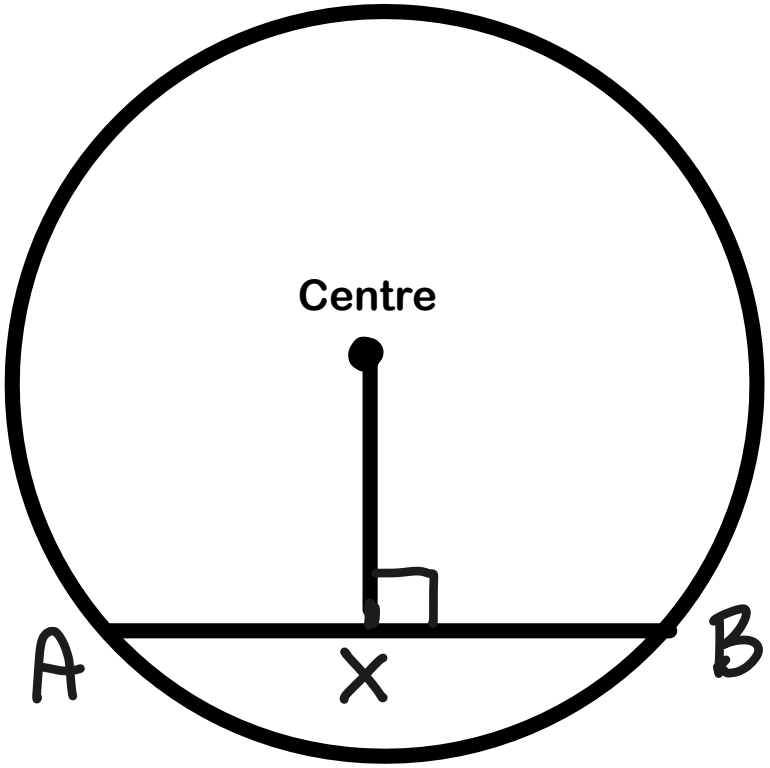
8.



9. A perpendicular line from centre to the chord will bisect chord

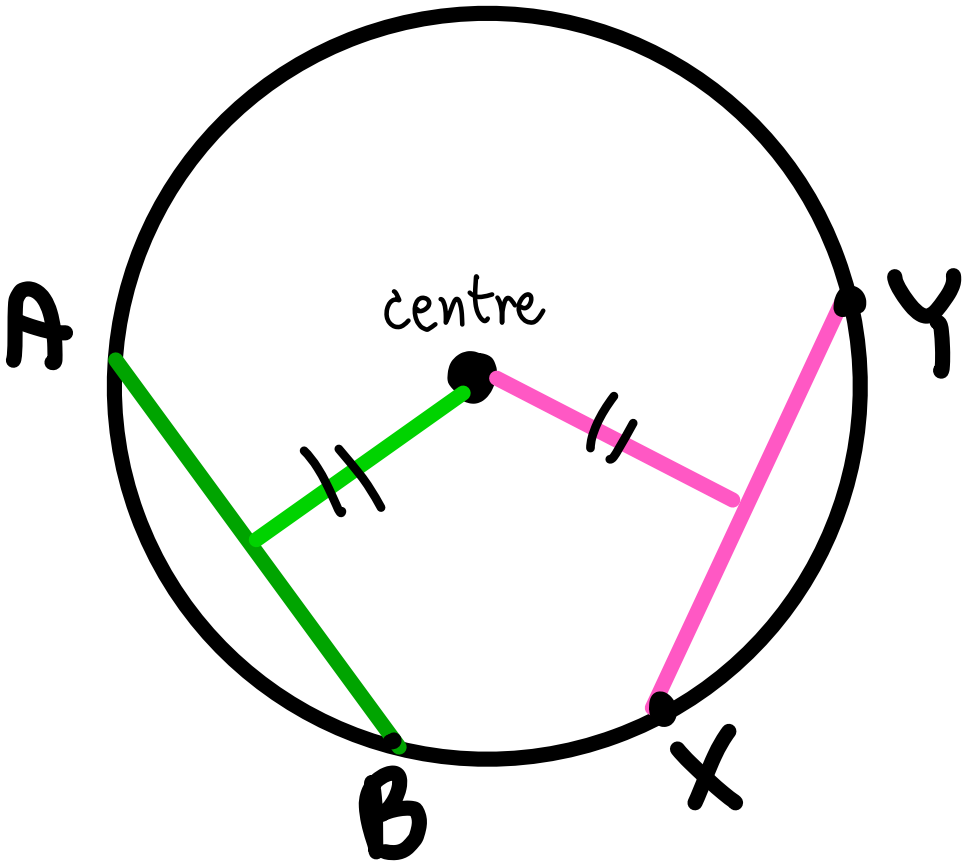



Centre
x
Chord



Find length of AX if AB is 10 cm

10. Equal chords of a circle are from the centre

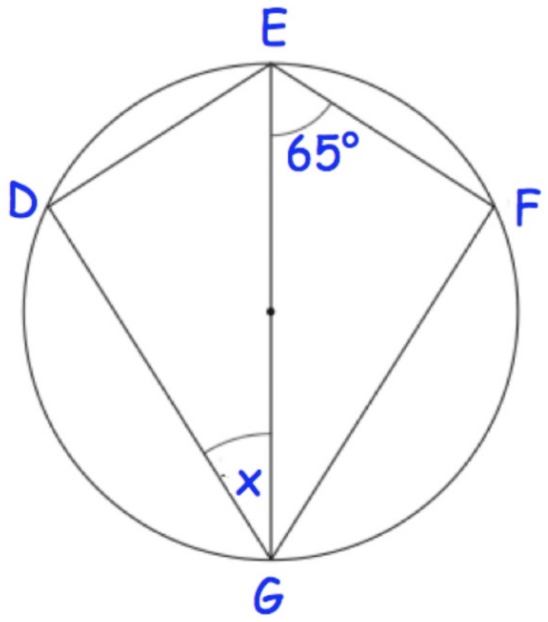


Circle theorems: Exercise

TOP Maths IGCSE

Question 1

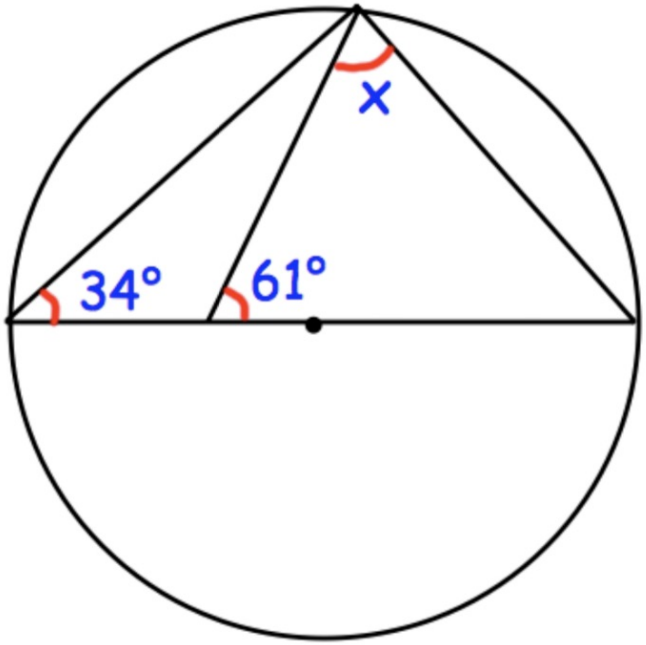
The diagram shows points D, E, F and G on the circumference of a circle.
EG is a diameter.
DEFG is a kite.



Work out the value of x.

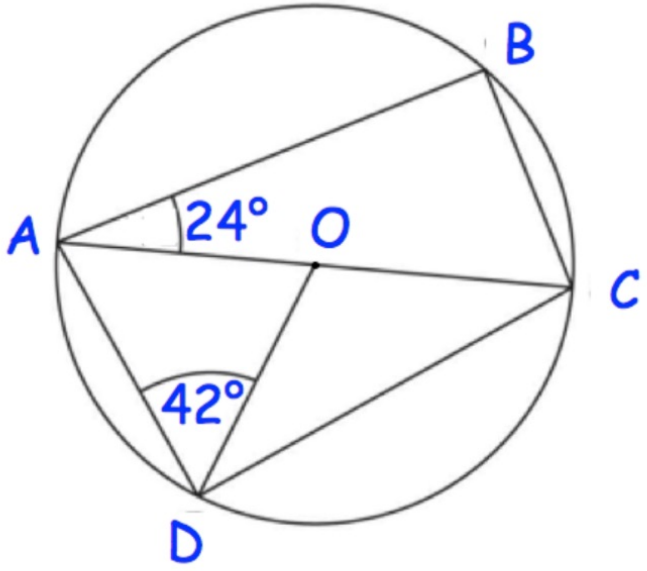
Question 2

AB is the diameter of a circle.



Work out the value of x.

Question 3



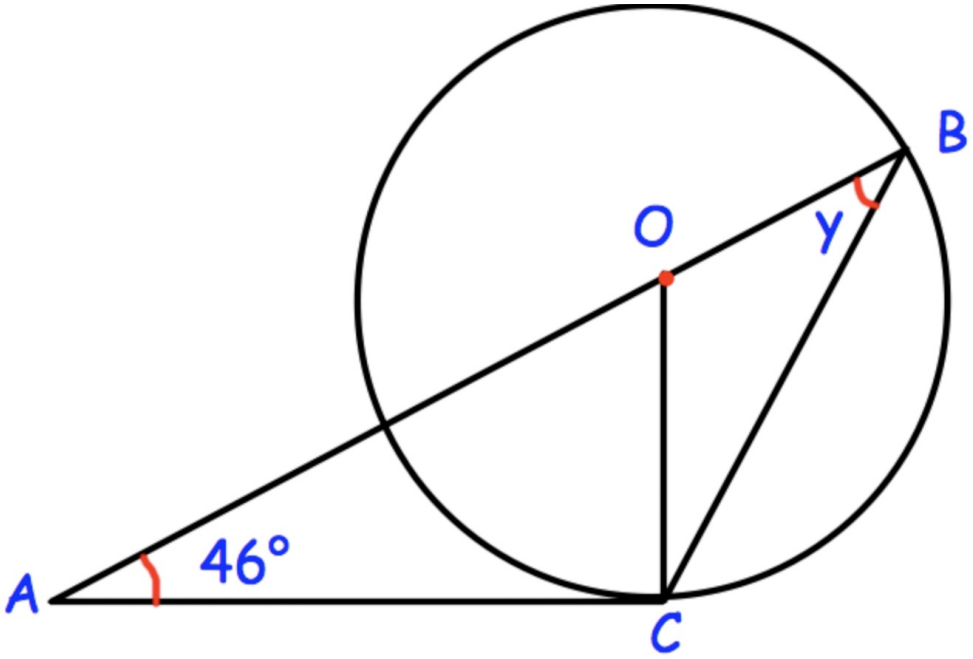
In the diagram O is the centre of the circle.
AOC is a straight line.
Angle BAO is 24° and Angle ADO is 42°

(a) Find the size of angle CAD.

(b) Find the size of angle ACB.

(c) Find the size of angle BCD.

Question 4

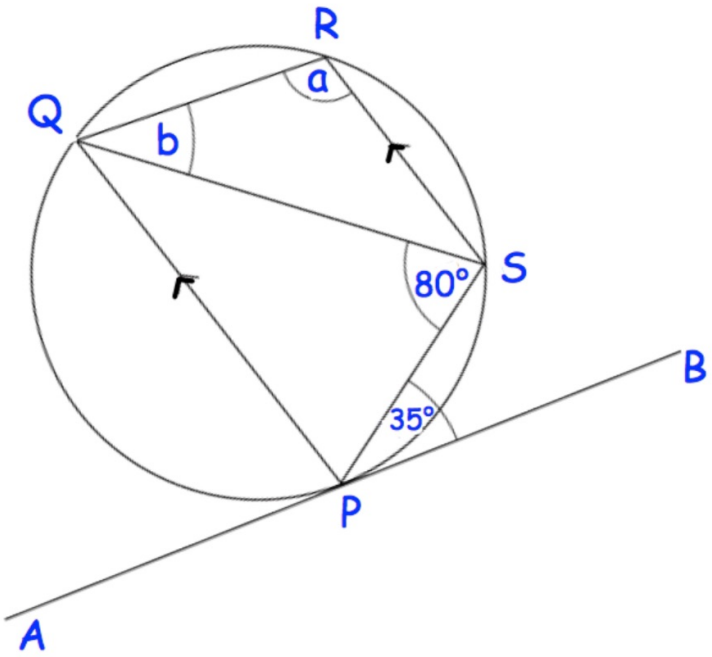


AOB is a straight line.
B and C are points on the circumference of a circle, centre O.
AC is a tangent to the circle.

Work out the size of the angle y.

Question 5

PQRS is a cyclic quadrilateral.
APB is a tangent to the circle at P.
PQ is parallel to SR.
Angle SPB = 35° and angle PSQ = 80°



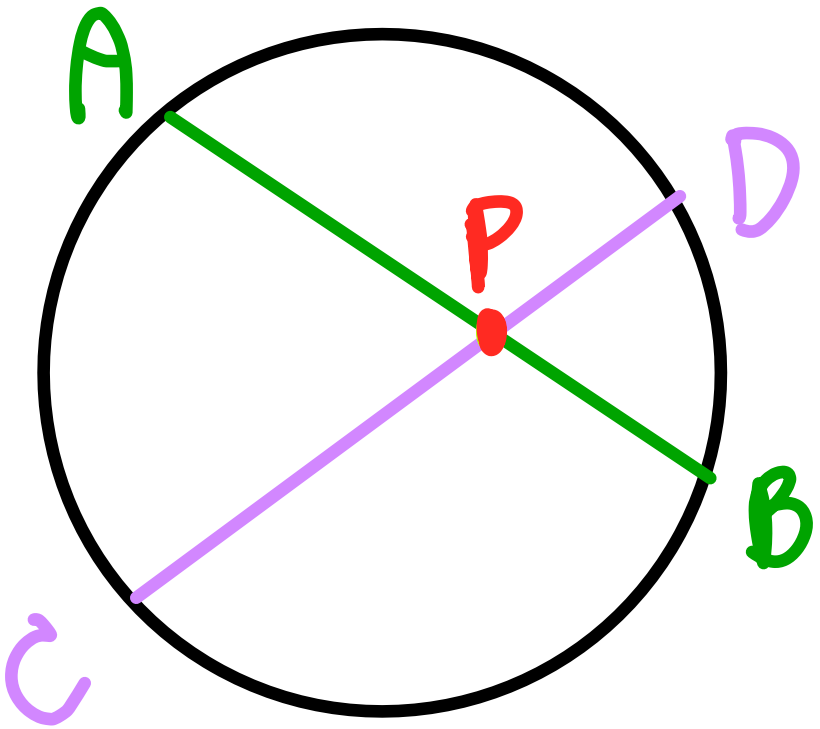
(a) Work out the size of angle QRS.

(b) Work out the size of angle RQS.

1. Circle theorem

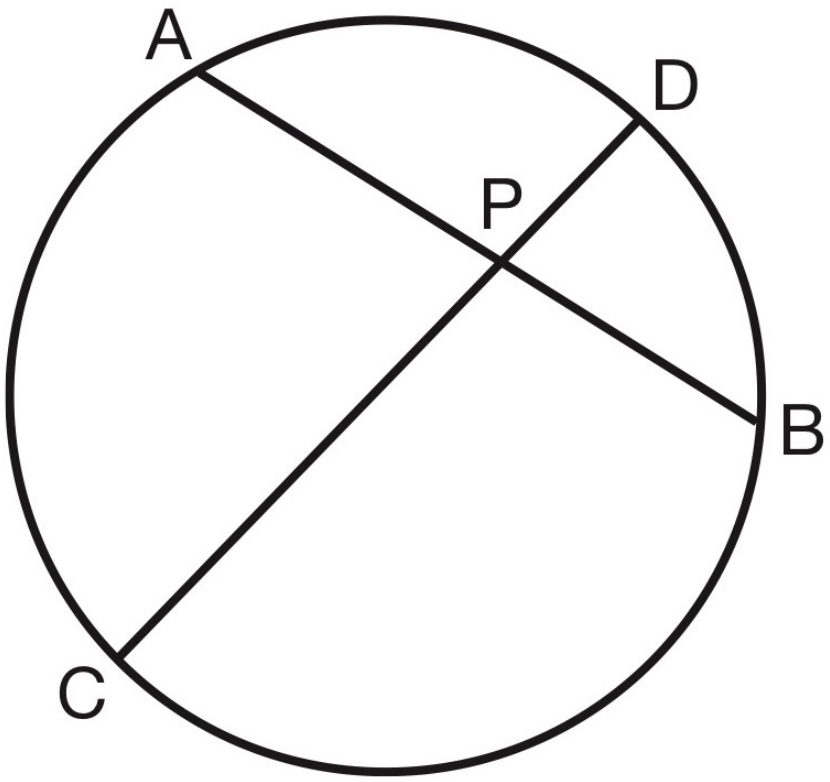
✅2. Intersecting chords theorem

1. Two chords intersect inside circle



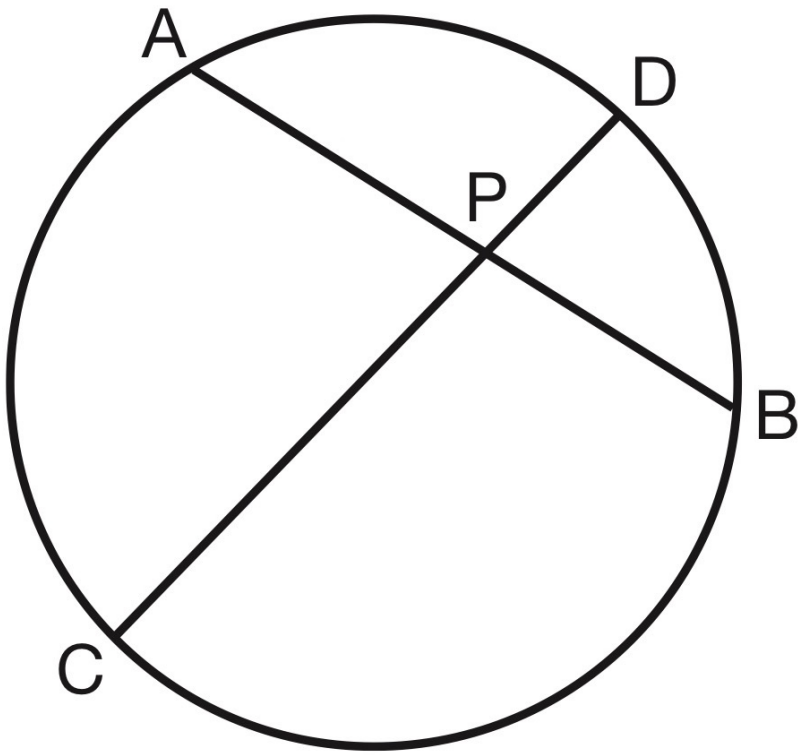
Example

AP = 8 , PD = 2 and PB = 3 . Find CP.



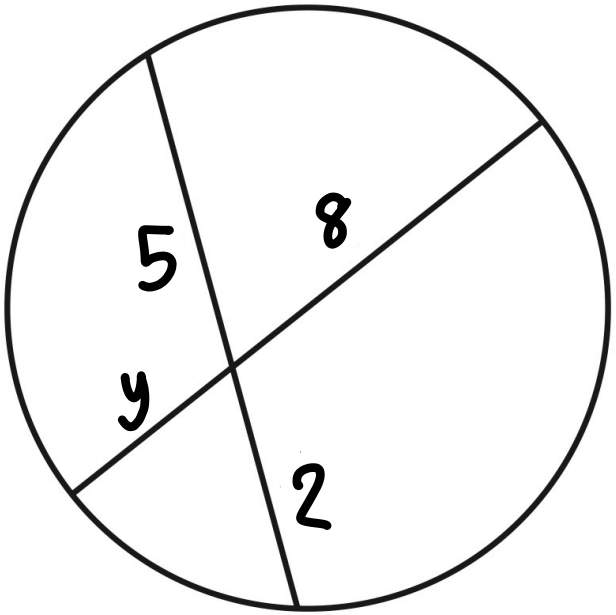
Example

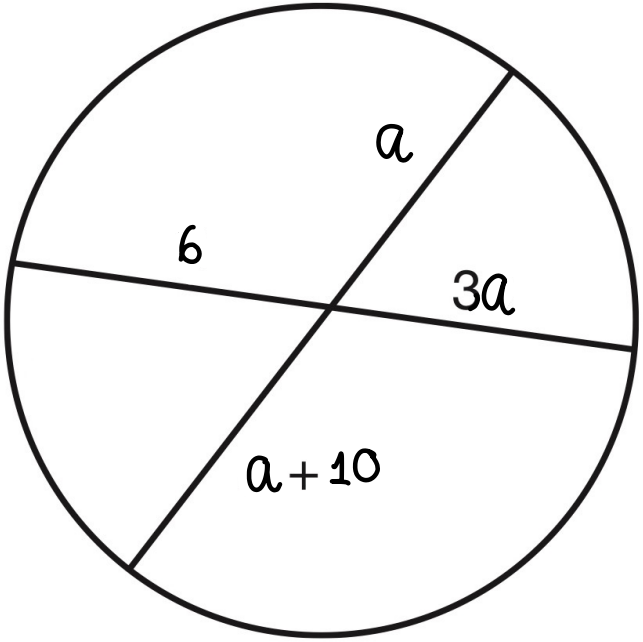
AP = 8, BP = 3 and CD = 10 Find DP.



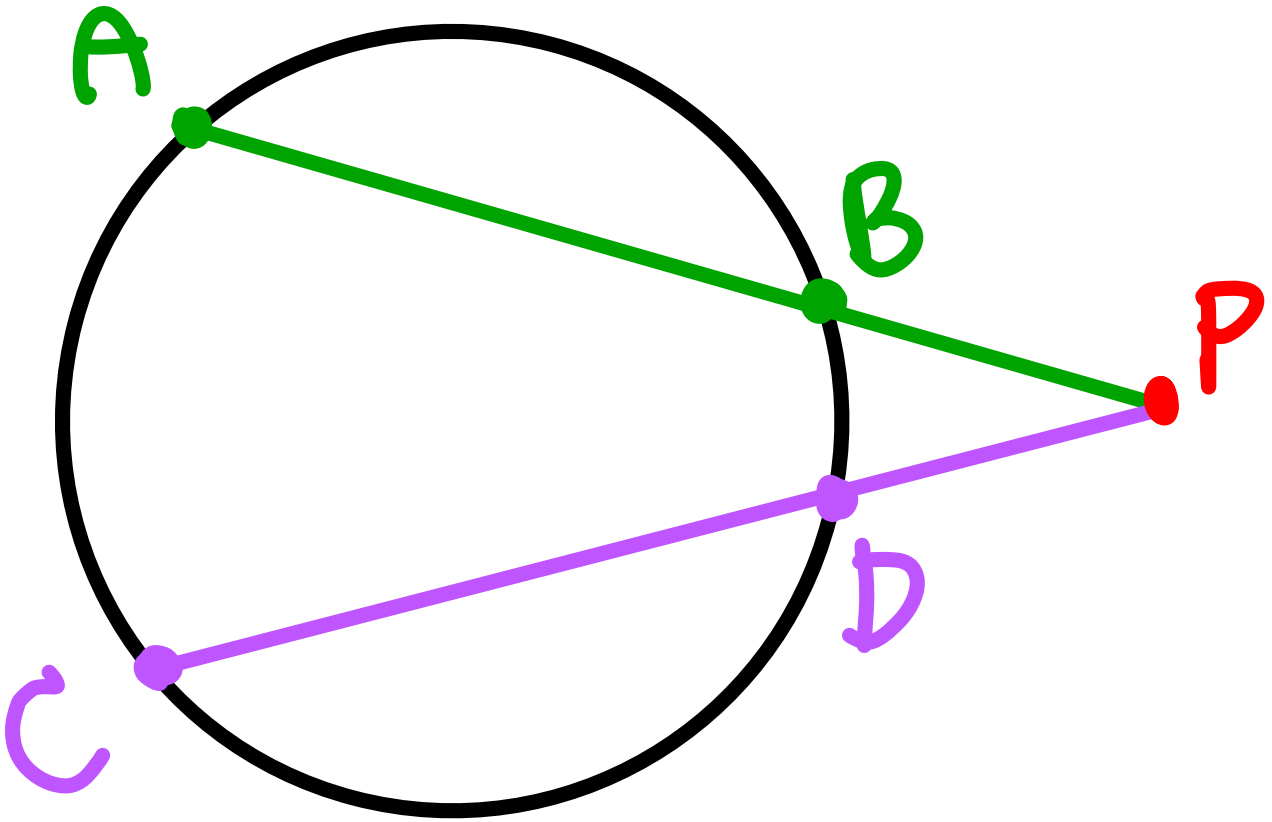
Circle geometry : Intersecting chords theorem

TOP Maths IGCSE



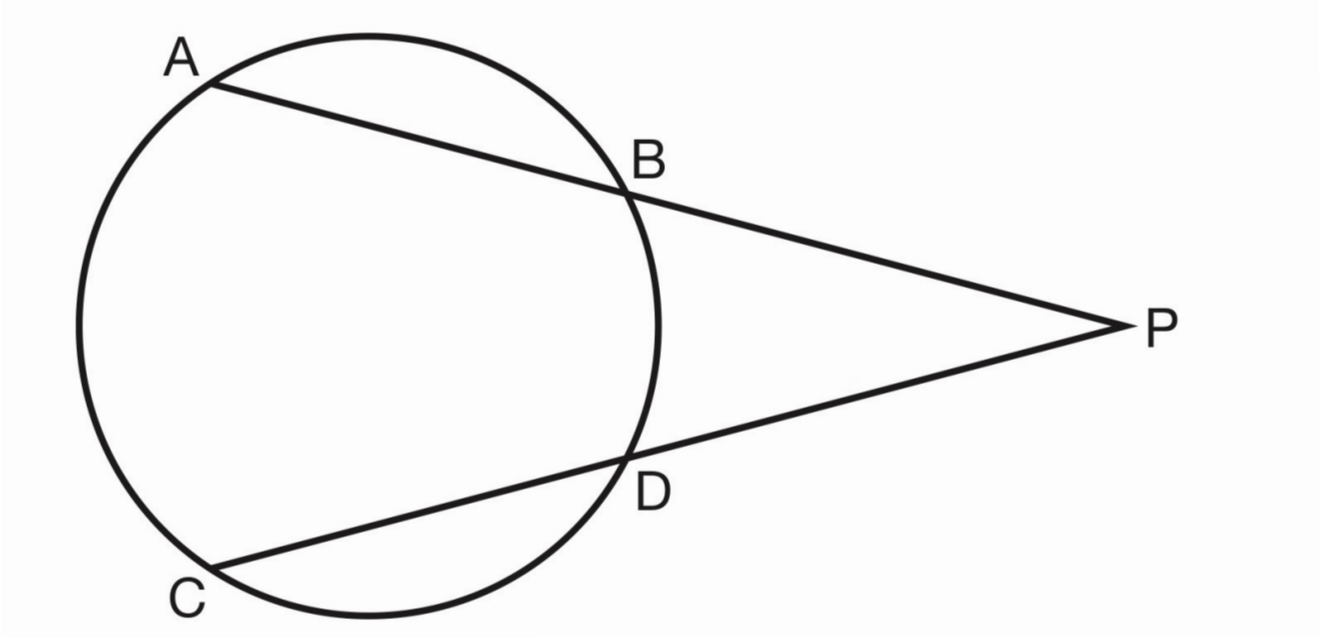


2. Two chords intersect outside circle



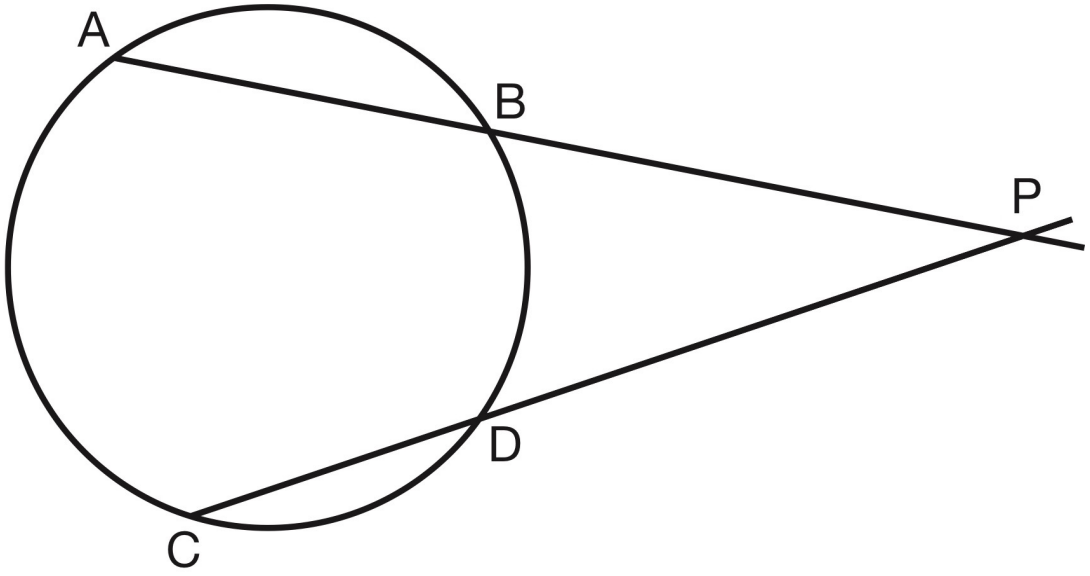
Example

CD = 12, DP = 8 and BP = 10. Find AB.



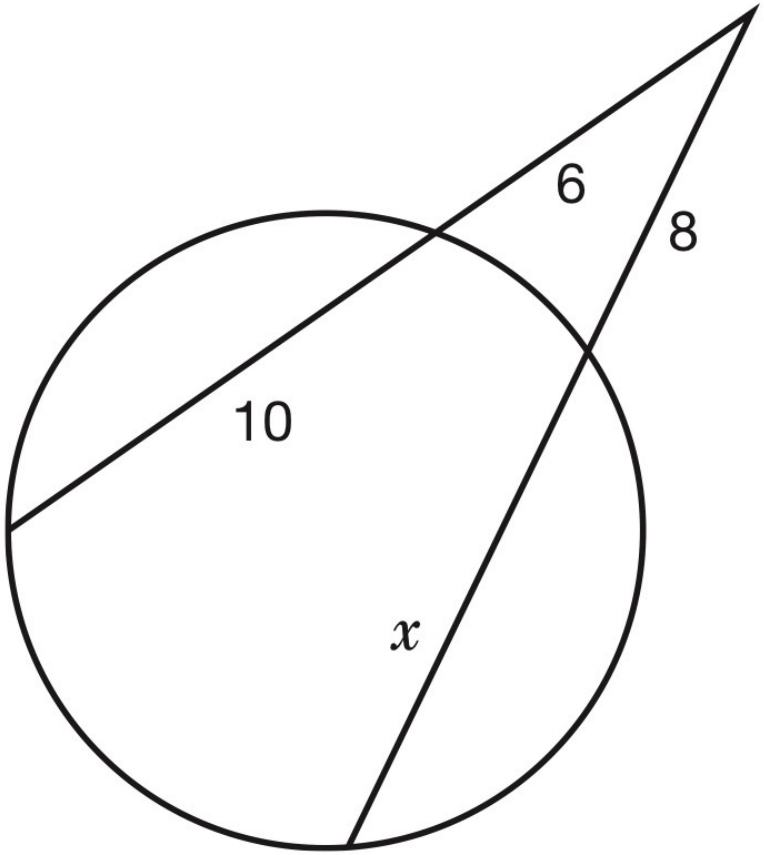
Example

AB = 16, BP = 12 and CD = 10. Find DP.



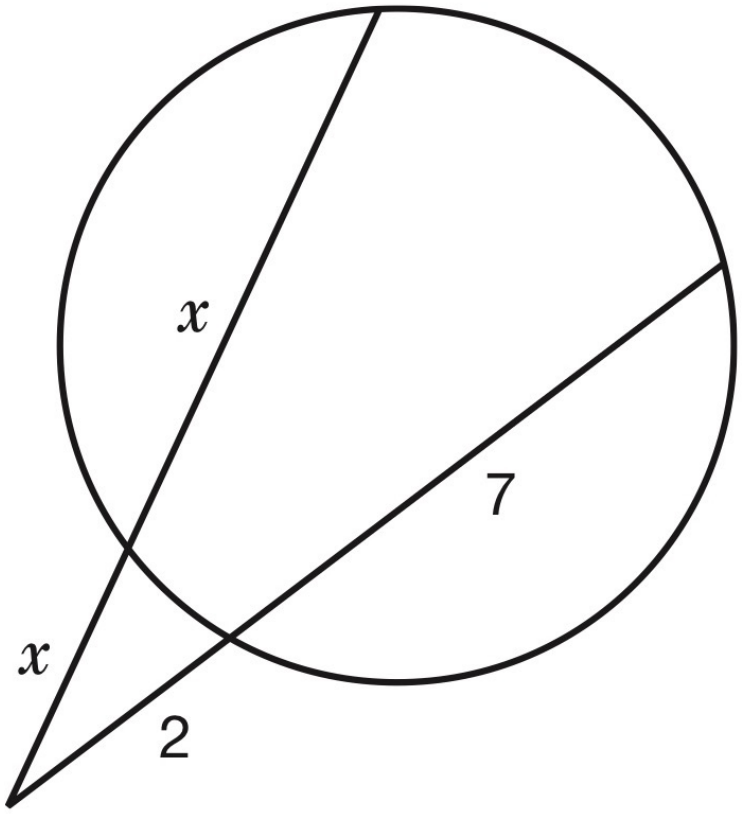
Circle geometry : Intersecting chords theorem

TOP Maths IGCSE



Circle geometry : Intersecting chords theorem

TOP Maths IGCSE



Circle geometry : Intersecting chords theorem

TOP Maths IGCSE

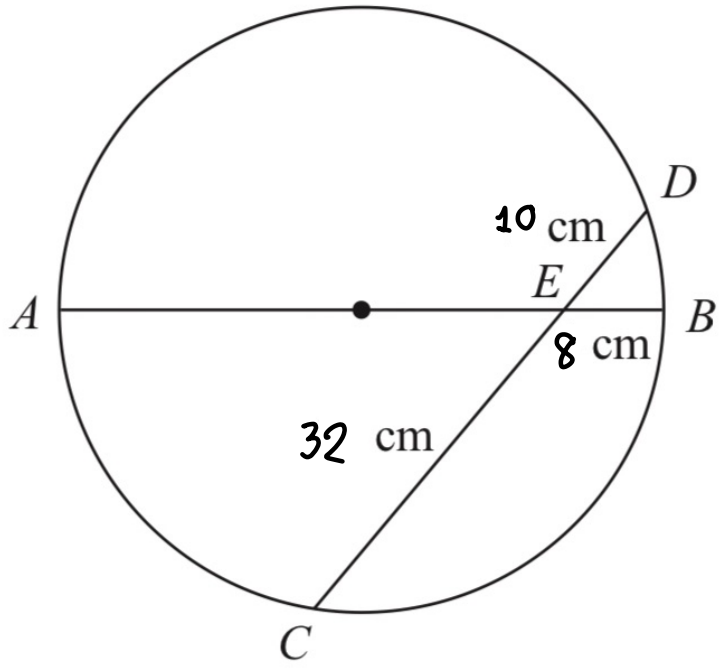


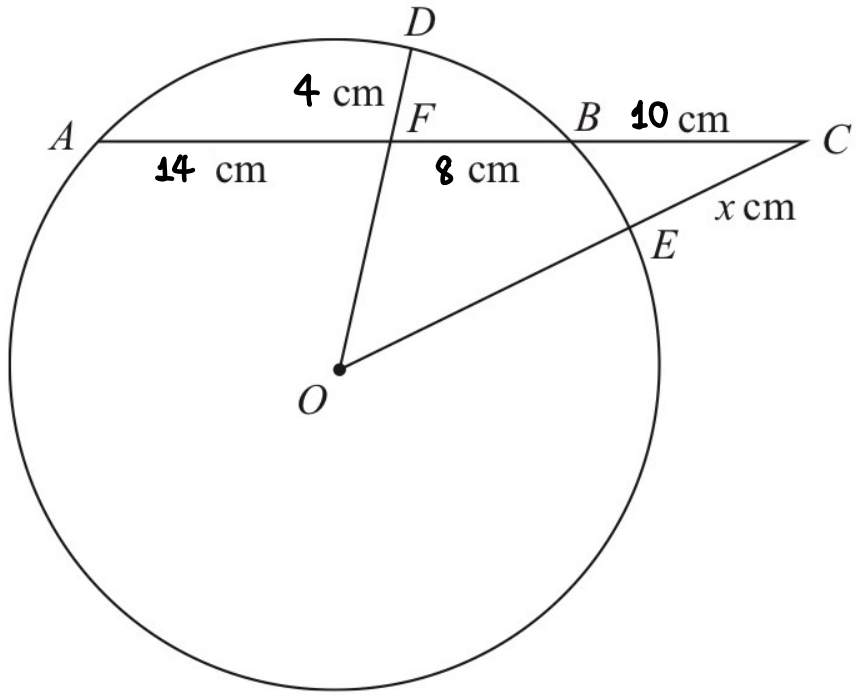
Diagram **NOT** accurately drawn

AB is a diameter of a circle.
CD is a chord of the circle.
AB and CD intersect at E.
$BE = 8$ cm, $CE = 32$ cm and $DE = 10$ cm.

Calculate the length of AE.

Circle geometry : Intersecting chords theorem

TOP Maths IGCSE



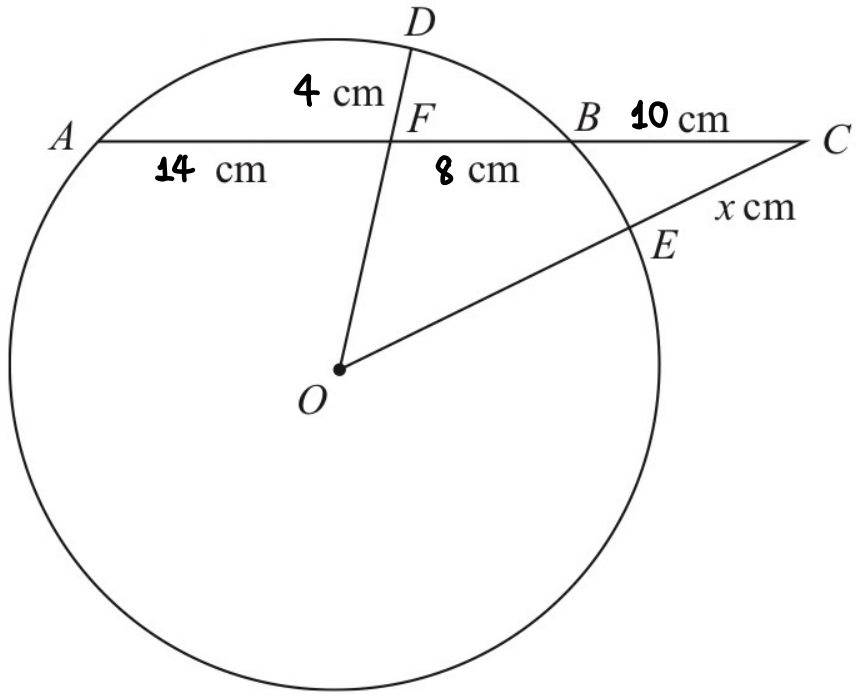
A, D, B and E are points on a circle, centre O.
$AFBC$, OEC and OFD are straight lines.

$AF = 14$ cm, $FB = 8$ cm, $BC = 10$ cm, $FD = 4$ cm and $CE = x$ cm.

Work out the value of x.
Show your working clearly.

Circle geometry : Intersecting chords theorem

TOP Maths IGCSE



A, D, B and E are points on a circle, centre O.
$AFBC$, OEC and OFD are straight lines.

$AF = 14$ cm, $FB = 8$ cm, $BC = 10$ cm, $FD = 4$ cm and $CE = x$ cm.

Work out the value of x.
Show your working clearly.