



MATHS

BOOKS - ICSE

CIRCLE

Example

1. In the figure, given alongside, CD is a diameter which meets the chord AB at E , such

that $AE = BE = 4$ cm. If CE is 3 cm, find the radius of the circle.



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2. एक आयत की लम्बाई x , 5 cm / min की दर से घट रही है और चौड़ाई y , 4 cm / min की दर से बढ़ रही है जब $x=8$ cm और $y=6$ cm है तब आयत के (a) परिमाप (b) क्षेत्रफल की परिवर्तन की दर ज्ञात कीजिए



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3. Chords AB and CD of a circle are parallel to each other and lie on opposite sides of the centre of the circle. If $AB = 36$ cm, $CD = 48$ cm and the distance between the chords is 42 cm, find the radius of the circle.



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4. Chords AB and CD of a circle with centre O, intersect at a point E. If OE bisects angle AED, prove that chord $AB =$ chord CD .





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5. BC is an equilateral triangle. A circle is drawn with centre A so that it cuts AB and AC at points M and N respectively. Prove that $BN = CM$



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6. Prove that the line joining the mid-points of two parallel chords of a circle passes through the centre.



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7. AB and CD are two equal chords of a circle with centre O. If AB and CD, on being produced, meet at a point P outside the circle, prove that :

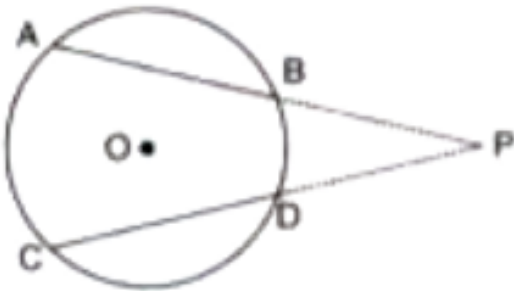


$PA = PC$



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8. AB and CD are two equal chords of a circle with centre O. If AB and CD, on being produced, meet at a point P outside the circle, prove that :



$$PB = PD$$



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9. Two circles with centres A and B intersect each other at points P and Q . Prove that the centre-line AB bisects the common chord PQ perpendicularly.



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10. Two circles with centres O and O' intersect each other at points P and Q . The straight line APB is parallel to centre-line OO' . Prove that :

$$OO' = \frac{1}{2} AB$$



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11. Out of two unequal chords of a circle, the bigger chord is closer to the centre of the circle. Prove it.



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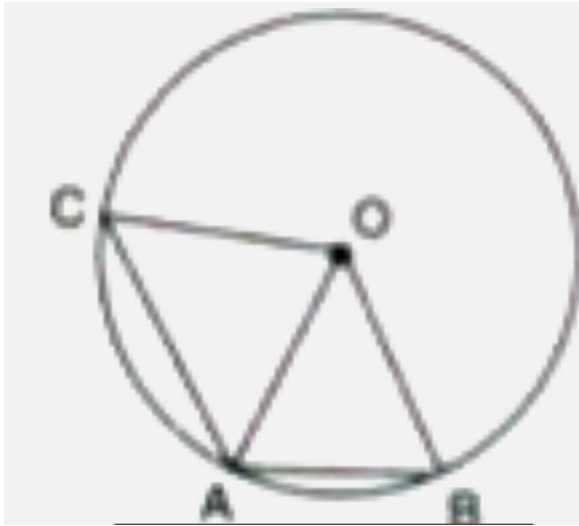
12. Three boys A, B and C are standing on the circumference of a circle with radius 10 cm and centre at point O. If the distance between A and B = distance between B and C = 12 cm, find the distance between A and C.



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13. In the given figure, O is the centre of a circle, AB is a side of regular octagon and AC is

a side of regular hexagon. Find :

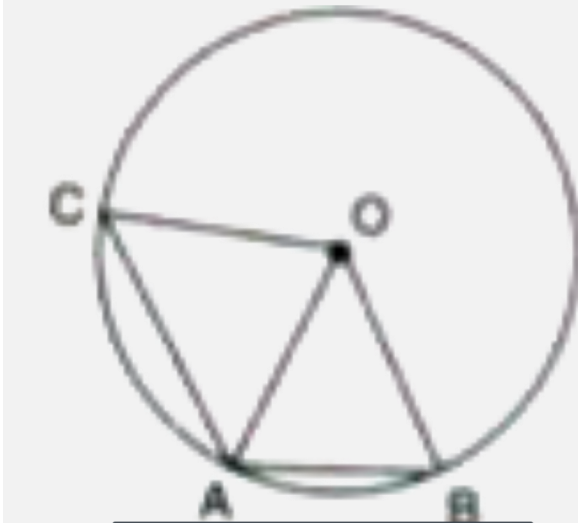


$\angle AOB$



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14. In the given figure, O is the centre of a circle, AB is a side of regular octagon and AC is a side of regular hexagon. Find :

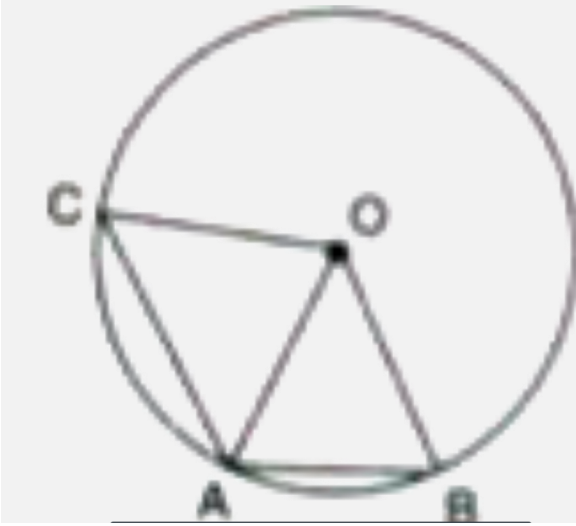


$\angle AOC$



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15. In the given figure, O is the centre of a circle, AB is a side of regular octagon and AC is a side of regular hexagon. Find :



$\angle BOC$.



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Exercise 17 A

1. A chord of length 6 cm is drawn in a circle of radius 5 cm. Calculate its distance from the centre of the circle.



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2. A chord of length 8 cm is drawn at a distance of 3 cm from the centre of a circle. Calculate the radius of the circle.



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3. The radius of a circle is 17.0 cm and the length of perpendicular drawn from its centre to a chord is 8.0 cm. Calculate the length of the chord.



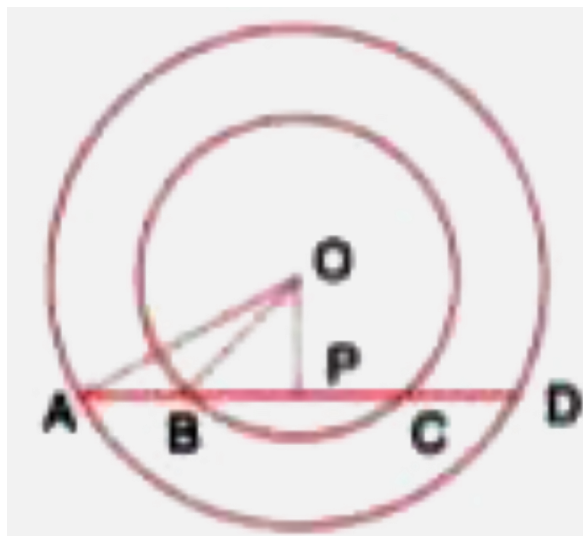
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4. A chord of length 24 cm is at a distance of 5 cm from the centre of the circle. Find the length of the chord of the same circle which is at a distance of 12 cm from the centre.



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5. In the following figure, AD is a straight line. $OP \perp AD$ and O is the centre of both the circles. If $OA = 34$ cm, $OB = 20$ cm and $OP = 16$ cm, find the length of AB.



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6. In a circle of radius 17 cm, two parallel chords of lengths 30 cm and 16 cm are drawn. Find the distance between the chords, if both the chords are :
on the opposite sides of the centre,



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7. In a circle of radius 17 cm, two parallel chords of lengths 30 cm and 16 cm are drawn. Find the distance between the chords, if both

the chords are :

on the same side of the centre




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8. Two parallel chords are drawn in a circle of diameter 30.0 cm. The length of one chord is 24.0 cm and the distance between the two chords is 21.0 cm, find the length of the other chord.



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9. A chord CD of a circle, whose centre is O, is bisected at P by a diameter AB.

 Given $OA = OB = 15$ cm and $OP = 9$ cm.

Calculate the lengths of :

CD



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10. A chord CD of a circle, whose centre is O, is bisected at P by a diameter AB.



Given $OA = OB = 15$ cm and $OP = 9$ cm. Calculate

the lengths of :

AD



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11. A chord CD of a circle, whose centre is O, is bisected at P by a diameter AB.



Given $OA = OB = 15$ cm and $OP = 9$ cm. Calculate the lengths of :

CB.



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12. The figure, given below, shows a circle with centre O in which diameter AB bisects the chord CD at point E . If $CE = ED = 8$ cm and $EB = 4$ cm, find the radius of the circle.



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13. In the given figure, O is the centre of the circle. AB and CD are two chords of the circle. OM is perpendicular to AB and ON is

perpendicular to CD. $AB = 24$ cm, $OM = 5$ cm,
 $ON = 12$ cm. Find the :



radius of the circle



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14. In the given figure, O is the centre of the circle. AB and CD are two chords of the circle. OM is perpendicular to AB and ON is perpendicular to CD. $AB = 24$ cm, $OM = 5$ cm, $ON = 12$ cm. Find the :



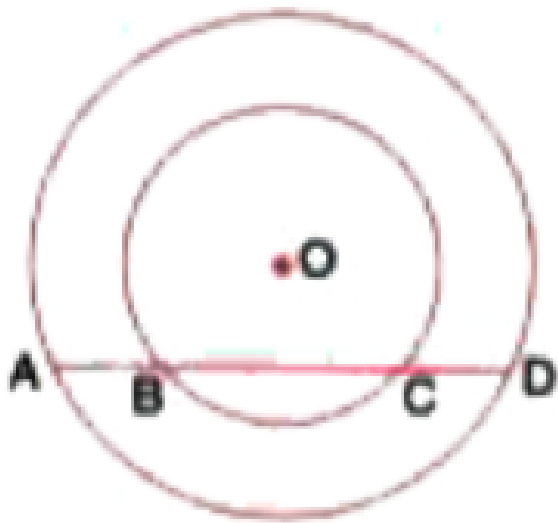
radius of the circle



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Exercise 17 B

1. The figure shows two concentric circles and AD is a chord of larger circle.

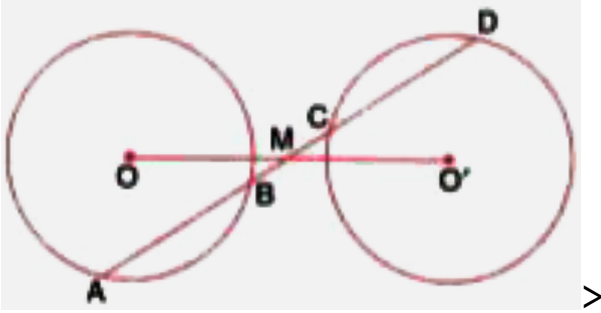


Prove that : $AB = CD$.



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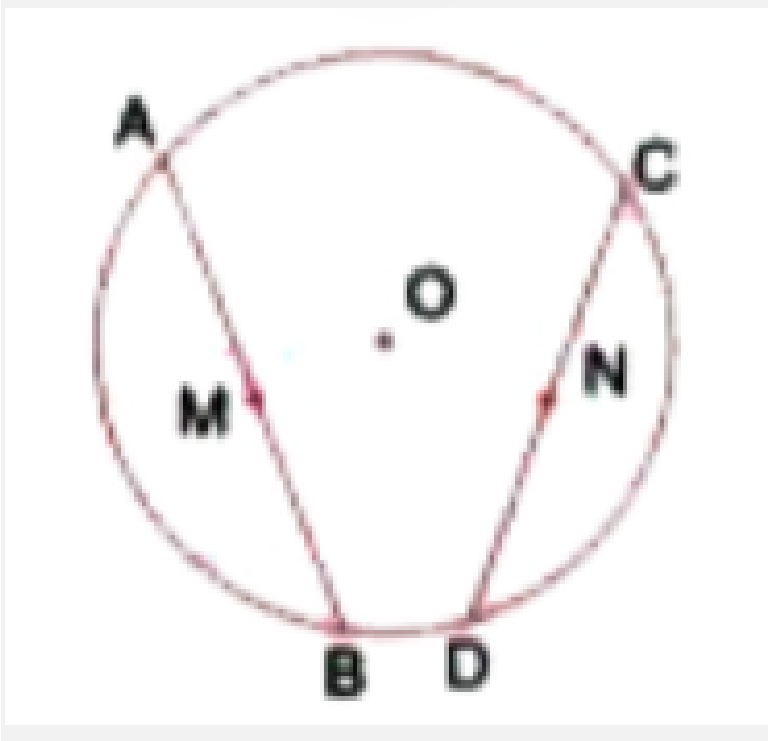
2. A straight line is drawn cutting two equal circles and passing through the mid-point M of the line joining their centres O and O'.



Prove that the chords AB and CD , which are intercepted by the two circles, are equal.

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3. M and N are the mid-points of two equal chords AB and CD respectively of a circle with centre O . Prove that :



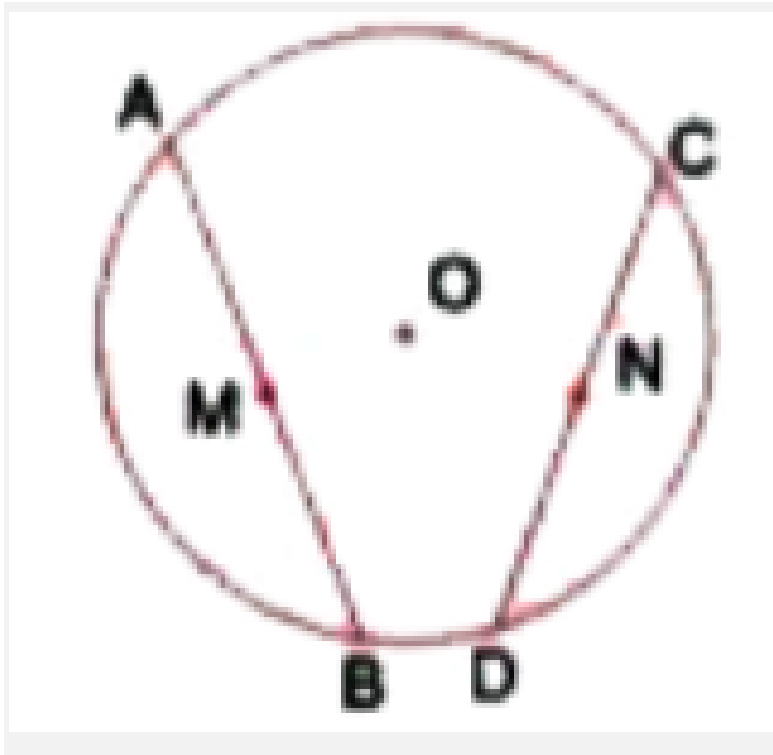
(i) $\angle BMN = \angle DNM$



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4. M and N are the mid-points of two equal chords AB and CD respectively of a circle with

centre O. Prove that :

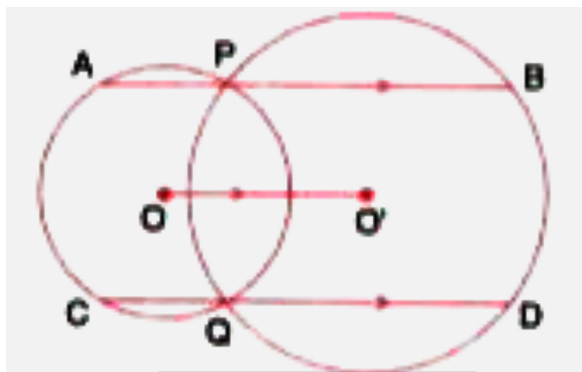


$$\angle AMN = \angle CNM.$$



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5. In the following figure, P and Q are the points of intersection of two circles with centres O and O'. If straight lines APB and CQD are parallel to OO', prove that



$$OO' = \frac{1}{2}AB = \frac{1}{2}CD$$



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6. In the following figure, P and Q are the points of intersection of two circles with centres O and O'. If straight lines APB and CQD are parallel to OO', prove that



$AB=CD$



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7. Two equal chords AB and CD of a circle with centre O, intersect each other at point P inside

the circle. Prove that



$$AP=CP$$



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8. Two equal chords AB and CD of a circle with centre O, intersect each other at point P inside the circle. Prove that



$$BP=DP$$



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9. In the following figure, OABC is a square. A circle is drawn with O as centre which meets OC at P and OA at Q. Prove that :



$$\triangle OPA = \triangle OQC,$$



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10. In the following figure, OABC is a square. A circle is drawn with O as centre which meets OC at P and OA at Q. Prove that :



$$\triangle BPC = \triangle BQA.$$



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11. The length of common chord of two intersecting circles is 30 cm. If the diameters of these two circles be 50 cm and 34 cm, calculate the distance between their centres.



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12. The line joining the mid-points of two chords of a circle passes through its centre.

Prove that the chords are parallel.



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13. In the following figure, the line ABCD is perpendicular to PQ, where P and Q are the centres of the circles. Show that :



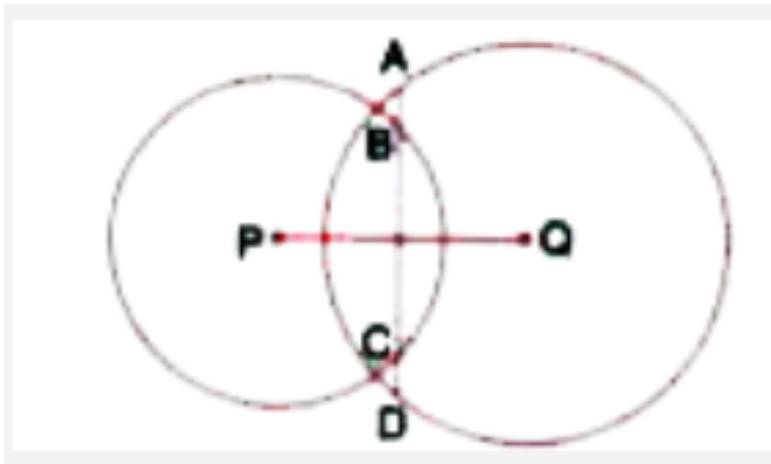
$AB=CD$





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14. In the following figure, the line $ABCD$ is perpendicular to PQ , where P and Q are the centres of the circles. Show that :



$AC=BD$



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15. AB and CD are two equal chords of a circle with centre O which intersect each other at right angle at point P. If $OM \perp AB$ and $ON \perp CD$, show that OMPN is a square.



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Exercise 17 C

1. In the given figure, an equilateral triangle ABC is inscribed in a circle with centre O. Find :

$\angle BOC$



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2. In the given figure, an equilateral triangle ABC is inscribed in a circle with centre O. Find :

$\angle OBC$



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3. In the given figure, a square is inscribed in a circle with centre O. Find :

$\angle BOC$. Is BD a diameter of the circle



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4. In the given figure, a square is inscribed in a circle with centre O. Find :

$\angle OCB$. Is BD a diameter of the circle



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5. In the given figure, a square is inscribed in a circle with centre O. Find :

$\angle COD$. Is BD a diameter of the circle



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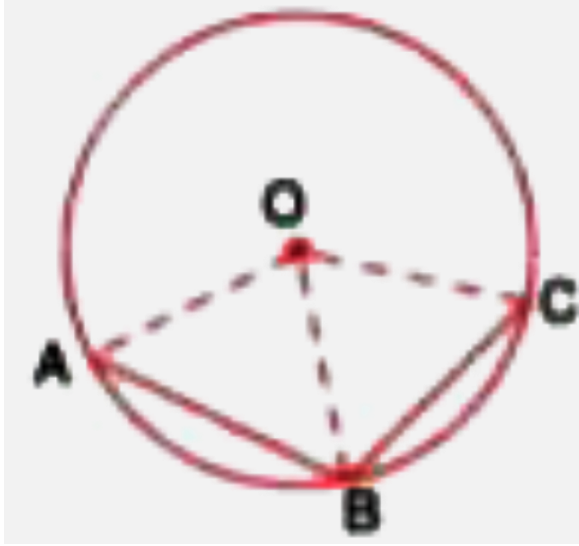
6. In the given figure, a square is inscribed in a circle with centre O. Find :

$\angle BOD$. Is BD a diameter of the circle



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7. In the given figure, AB is a side of regular pentagon and BC is a side of regular hexagon.

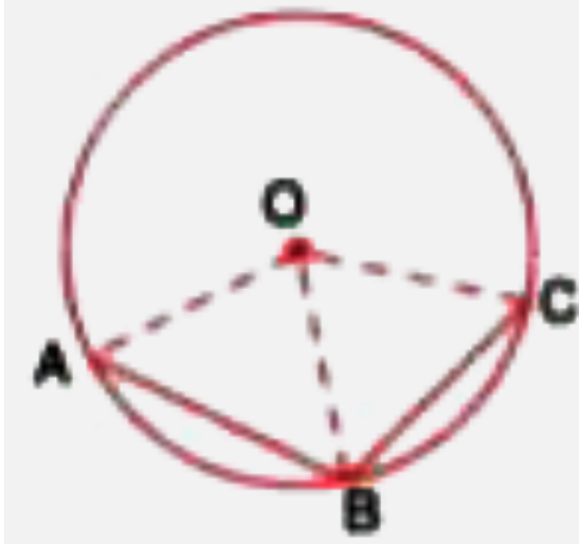


$\angle AOB$



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8. In the given figure, AB is a side of regular pentagon and BC is a side of regular hexagon.



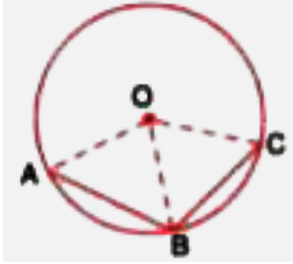
$\angle BOC$



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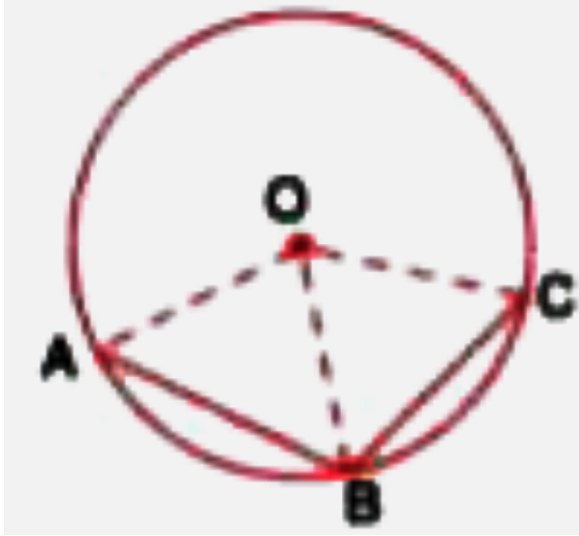
9. In the given figure, AB is a side of regular pentagon and BC is a side of regular hexagon.

$\angle AOC$



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10. In the given figure, AB is a side of regular pentagon and BC is a side of regular hexagon.

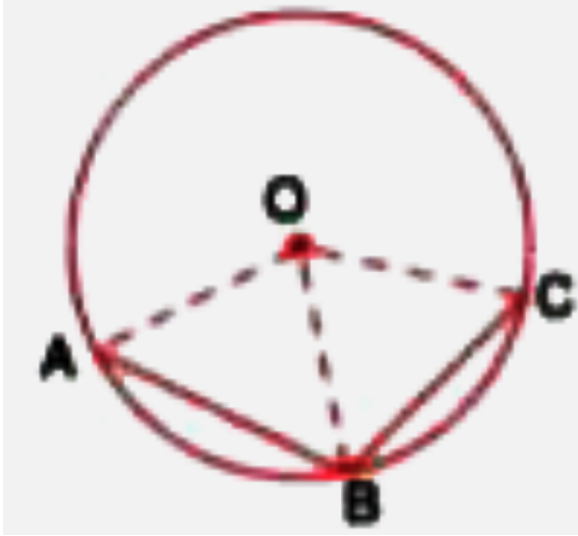


$\angle OBA$



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11. In the given figure, AB is a side of regular pentagon and BC is a side of regular hexagon.

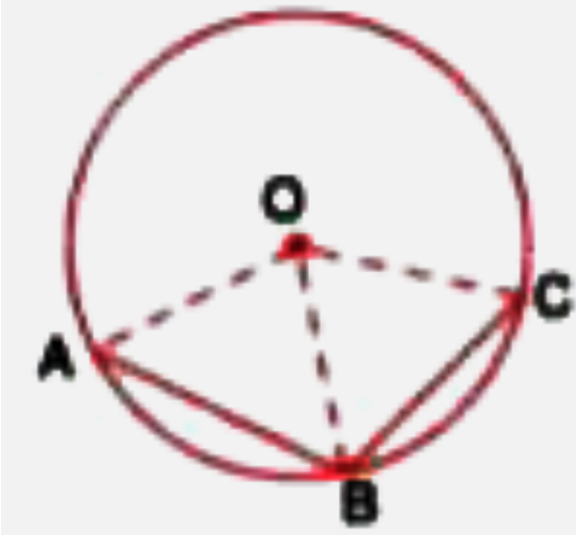


$\angle OBC$



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12. In the given figure, AB is a side of regular pentagon and BC is a side of regular hexagon.



$\angle ABC$



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13. In the given figure, arc AB and arc BC are equal in length. If $\angle AOB = 48^\circ$, find



$\angle BOC$



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14. In the given figure, arc AB and arc BC are equal in length. If $\angle AOB = 48^\circ$, find



$\angle OBC$



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15. In the given figure, arc AB and arc BC are equal in length. If $\angle AOB = 48^\circ$, find



$\angle AOC$



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16. In the given figure, arc AB and arc BC are equal in length. If $\angle AOB = 48^\circ$, find



$\angle OAC$





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17. In the given figure, the lengths of arcs AB and BC are in the ratio 3 : 2. If $\angle AOB = 96^\circ$, find:



$\angle BOC$



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18. In the given figure, the lengths of arcs AB and BC are in the ratio 3 : 2. If $\angle AOB = 96^\circ$,

find:



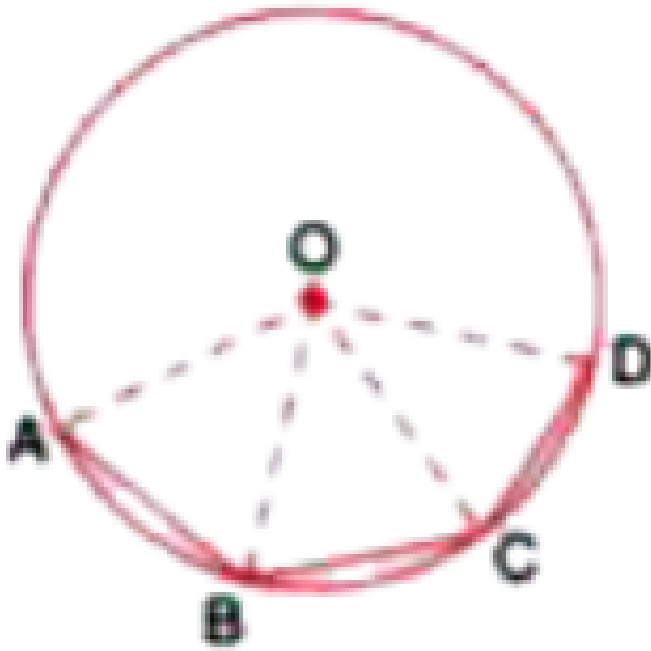
$\angle ABC$



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19. In the given figure, $AB = BC = DC$ and

$\angle AOB = 50^\circ$



$\angle AOC = ?$



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20. In the given figure, $AB = BC = DC$ and

$$\angle AOB = 50^\circ$$



$$\angle AOD$$



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21. In the given figure, $AB = BC = DC$ and

$$\angle AOB = 50^\circ$$



$$\angle BOD$$





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22. In the given figure, $AB = BC = DC$ and

$$\angle AOB = 50^\circ$$



$$\angle OAC$$



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23. In the given figure, $AB = BC = DC$ and

$$\angle AOB = 50^\circ$$

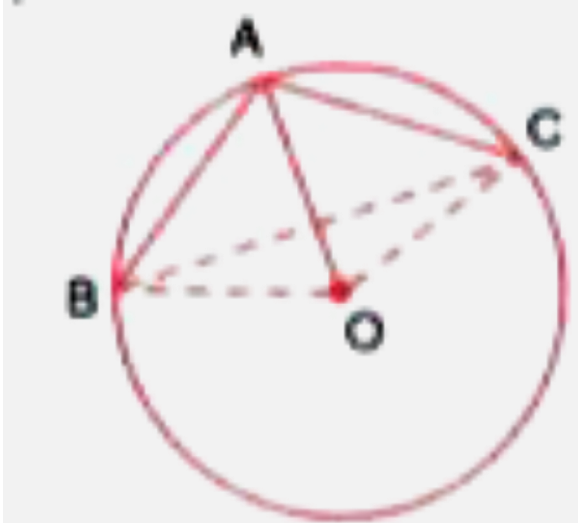


$\angle ODA$



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24. In the given figure, AB is a side of a regular hexagon and AC is a side of a regular eight sided polygon. Find :

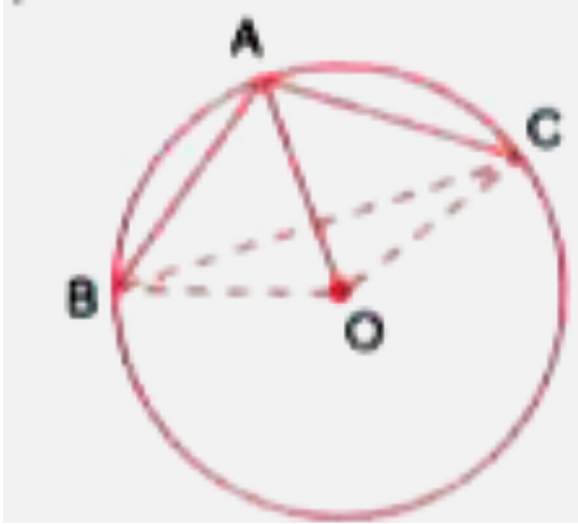


$\angle AOB$



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25. In the given figure, AB is a side of a regular hexagon and AC is a side of a regular eight sided polygon. Find :

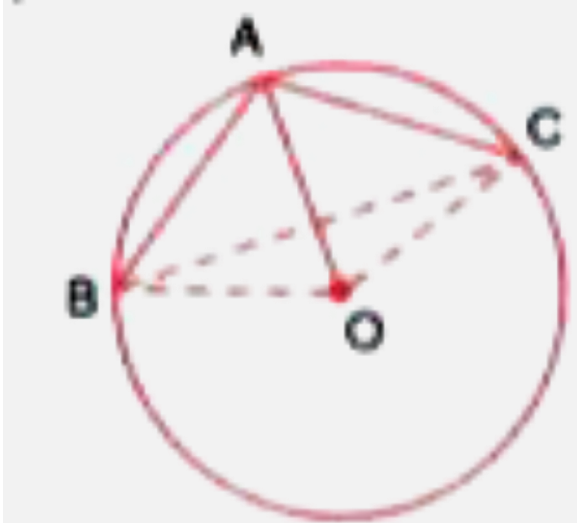


$\angle AOC$



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26. In the given figure, AB is a side of a regular hexagon and AC is a side of a regular eight sided polygon. Find :

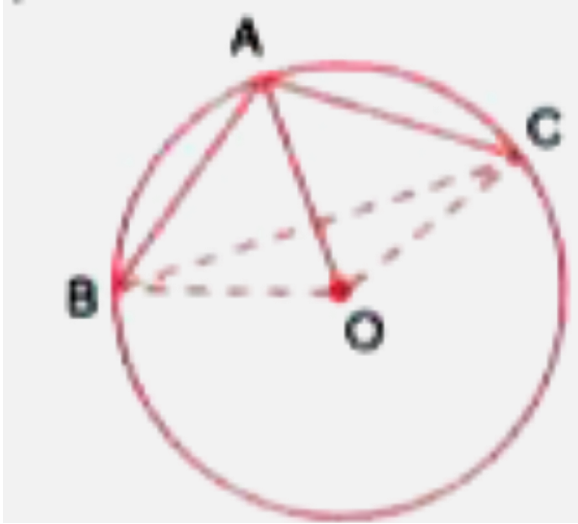


$\angle BOC$



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27. In the given figure, AB is a side of a regular hexagon and AC is a side of a regular eight sided polygon. Find :



$\angle OBC$



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28. In the given figure, O is the centre of the circle and the length of arc AB is twice the length of arc BC.

if $\angle AOB = 100^\circ$ find $\angle BOC$



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29. In the given figure, O is the centre of the circle and the length of arc AB is twice the length of arc BC .

if $\angle AOB = 100^\circ$ find



$\angle OAC$



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1. The radius of a circle is 13 cm and the length of one of its chords is 24 cm. Find the distance of the chord from the centres.



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2. Prove that equal chords of congruent circles subtend equal angles at their centre.



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3. Draw the circles of different radii. How many points, these circles can have in common ?
What is the maximum number of common points ?



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4. Suppose you are given a circle. Describe a method by which you can find the centre of this circle.



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5. Given two equal chords AB and CD of a circle, with centre O, intersecting each other at point p prove that



$AP=CP$



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6. Given two equal chords AB and CD of a circle, with centre O, intersecting each other at point p prove that



BP=DP



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7. In a circle of radius 10 cm, AB and CD are two parallel chords of lengths 16 cm and 12 cm respectively. Calculate the distance between the chords, if they are on the same side of the centre.



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8. In a circle of radius 10 cm, AB and CD are two parallel chords of lengths 16 cm and 12 cm respectively. Calculate the distance between the chords, if they are on the opposite sides of the centre.



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9. In the given figure, O is the centre of the circle with radius 20 cm and OD is perpendicular to AB. If $AB = 32$ cm, find the

length of CD



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10. In the given figure, AB and CD are two equal chords of a circle, with centre O. If P is the mid-point of chord AB, Q is the mid-point of chord CD and $\angle POQ = 150^\circ$ find $\angle APQ$



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11. In the given figure, AOC is the diameter of the circle, with centre O.



If arc AXB is half of arc BYC, find ZBOC.



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12. The circumference of a circle, with centre O, is divided into three arcs APB, BQC and CRA

such that :

$$\frac{\text{arc}APB}{2} = \frac{\text{arc}BQC}{3} = \frac{\text{arc}CRA}{4} \quad \text{Find}$$

$\angle BOC$.



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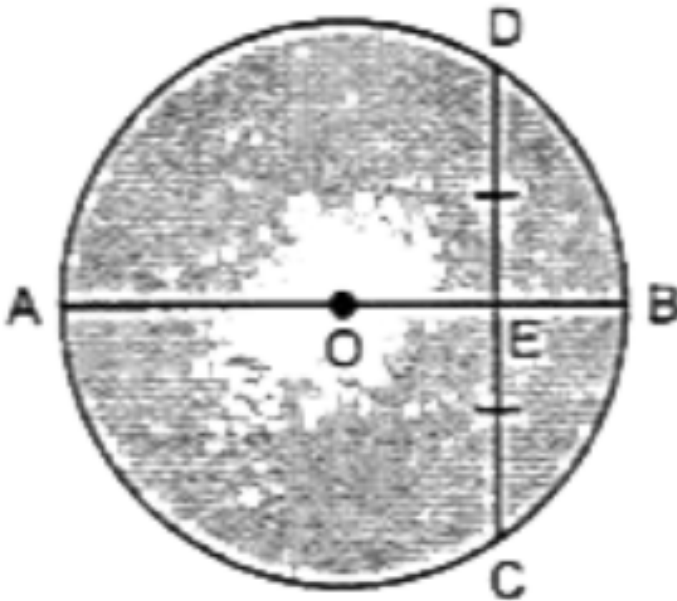
Topic 1

1. A chord of length 24 cm is at a distance of 5 cm from the centre of the circle. Find the length of the chord of the same circle which is at a distance of 12 cm from the centre.



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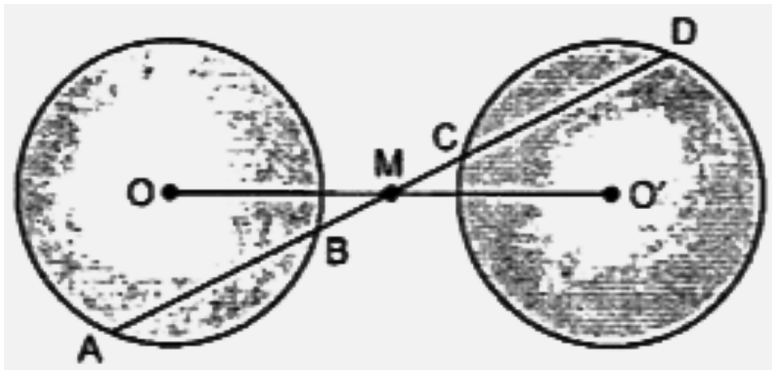
2. The figure, given below, show a circle with centre O in which diameter AB bisects the chord CD at point E . If $CE = ED = 8$ cm and $EB = 4$ cm. Find the radius of the circle.



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3. A straight line is drawn cutting two equal circles and passing through the mid-point M of the joining their centres O and O' .

Prove that the chord AB and CD , which are intercepted by the two circles, are equal



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4. The length of common chord of two intersecting circles is 30 cm. If the diameters of these two circles be 50 cm and 34 cm. Calculate the distance between their centres.



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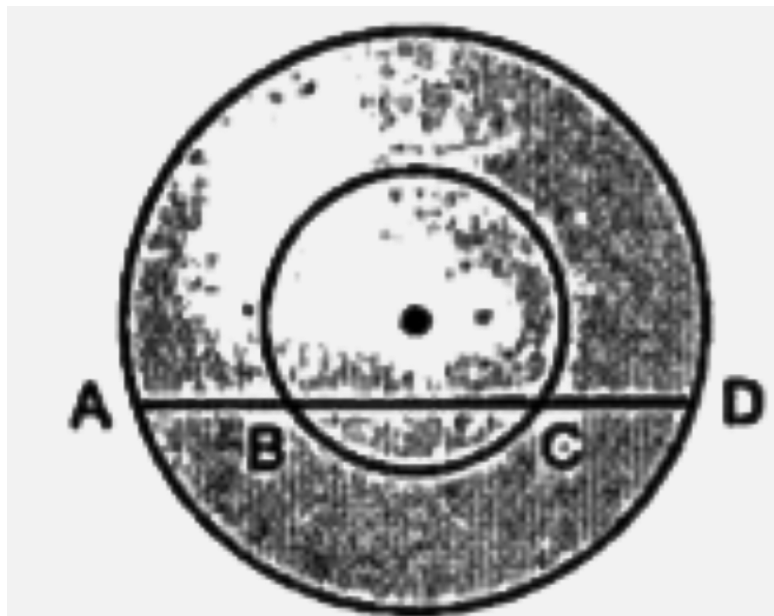
5. In the following the line ABCD is perpendicular to PQ. P and Q are the centres of the circles Show that: $AB=CD$





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6. The shows two concentric circles and AD is a chord of lenger circle. prove that $AB=CD$



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7. In a circle of radius 17 cm, two parallel chords of length 30 cm and 16 cm are drawn, find the distance between the chords, if both the chords are :

On the opposite sides of the centre,



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8. In a circle of radius 17 cm, two parallel chords of lengths 30 cm and 16 cm are drawn. Find the distance between the chords, if both

the chords are :

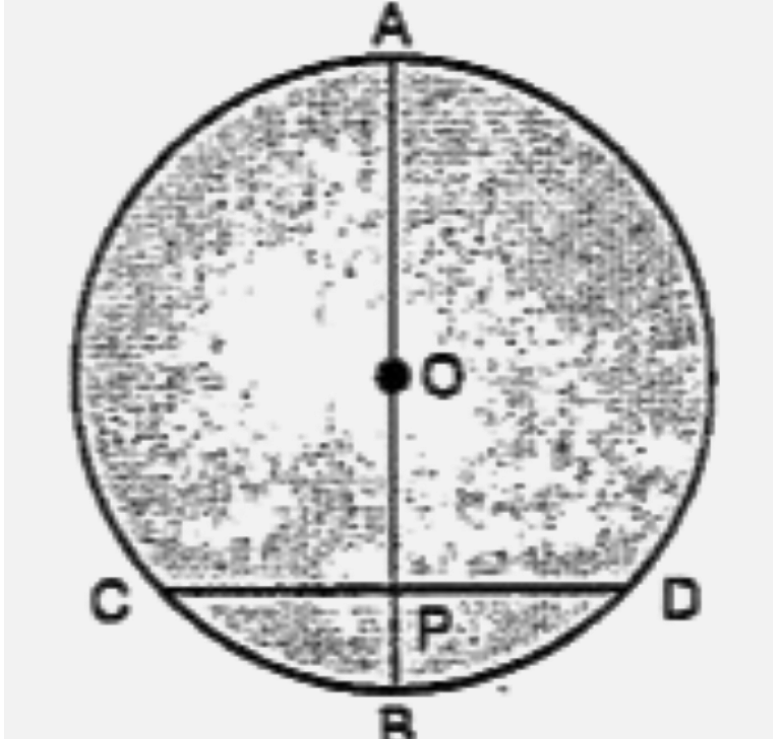
on the same side of the centre



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9. A chord CD of a circle, whose centre is O, is bisected at P by a diameter AB.

Given $OA = OB = 15$ cm and $OP = 9$ cm.



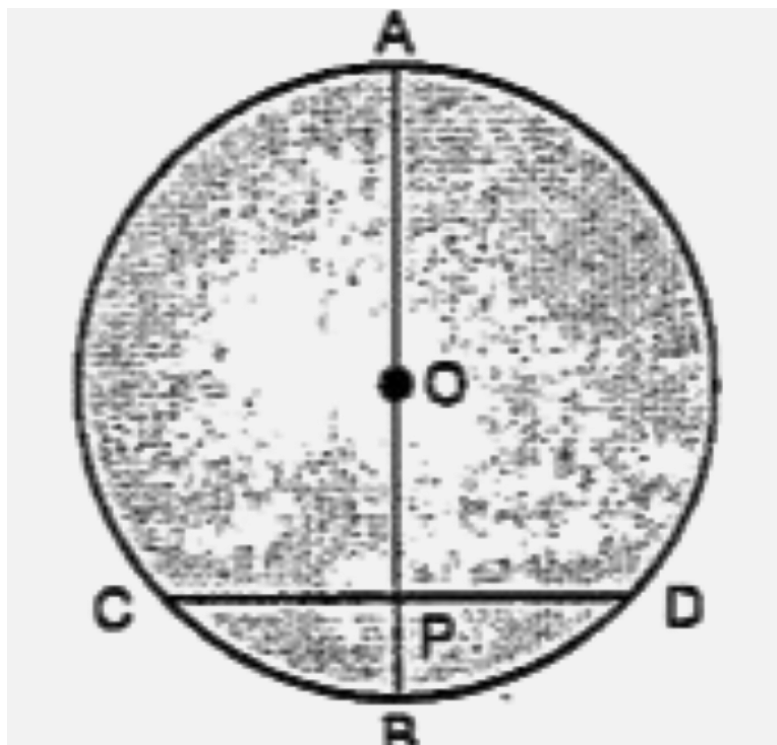
CD



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10. A chord CD of a circle, whose centre is O , is bisected at P by a diameter AB .

Give $OA = OB = 15$ cm and $OP = 9$ cm.



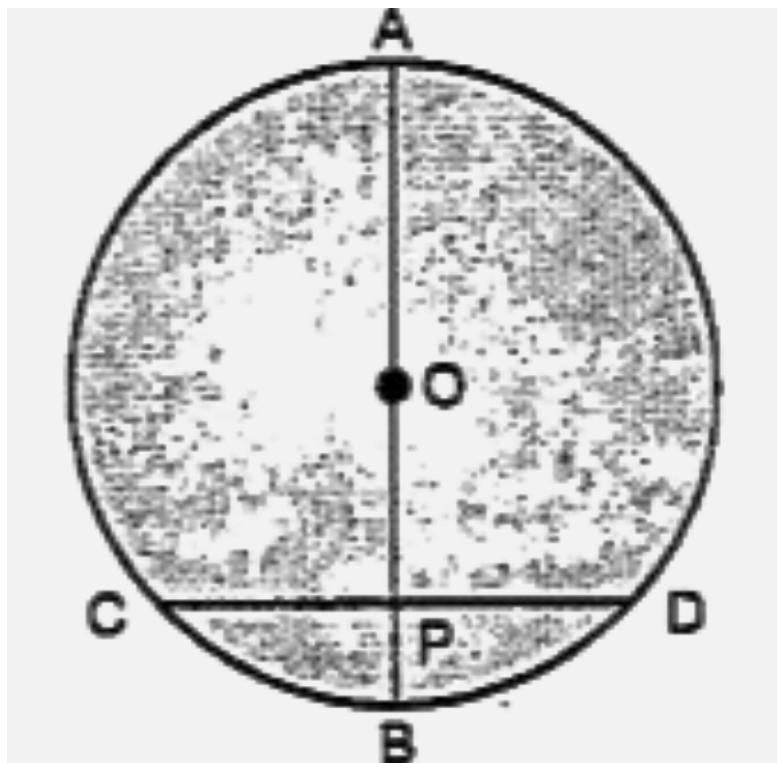
AD



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11. A chord CD of a circle, whose centre is O, is bisected at P by a diameter AB.

Give $OA = OB = 15$ cm and $OP = 9$ cm.

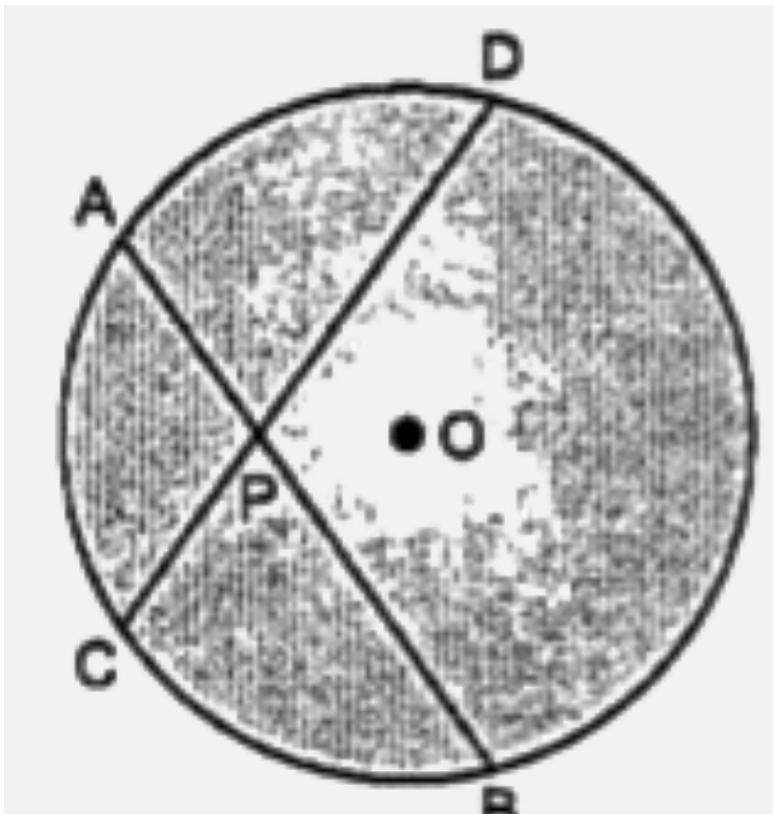


CB



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12. Two equal chord AB and CD of a circle with centre O , intersect each other at point P inside the circle.



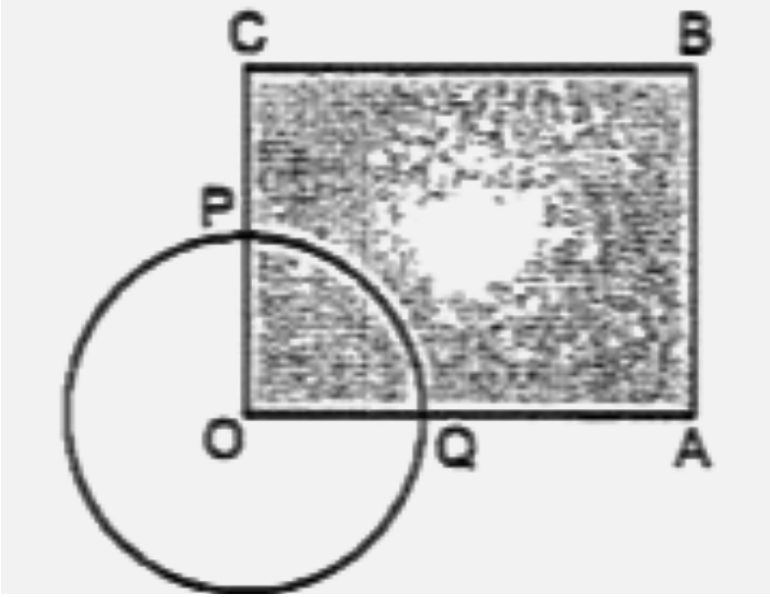
Prove that:

$$BP = DP$$



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13. In the following figure, $OABC$ is a square. A circle is drawn with O as centre which meets OC at P and OA at Q . Prove that:

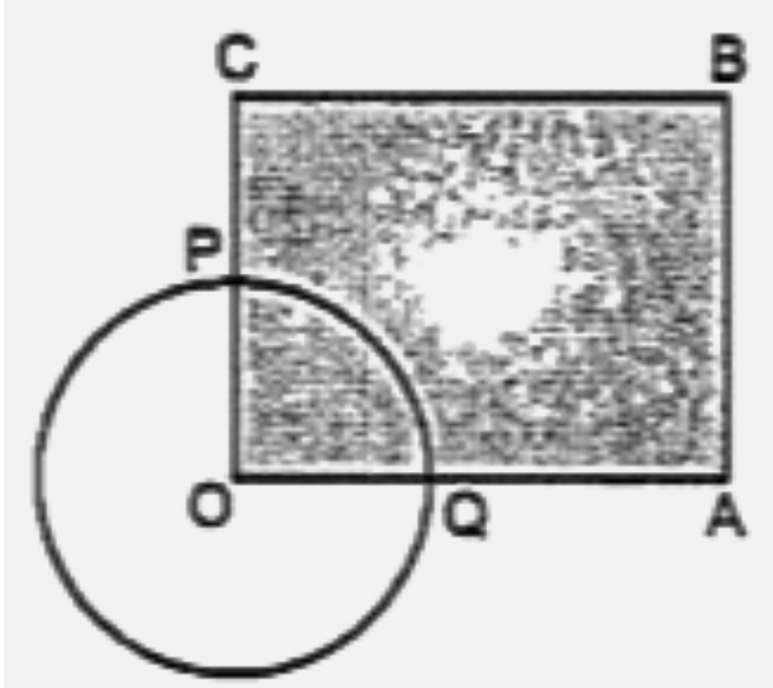


$$\triangle OPA \cong \triangle OQC$$



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14. In the following figure, OABC is a square. A circle is drawn with O as centre which meets OC at P and OA at Q. Prove that:



$$\triangle BPC \cong \triangle BQA$$



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15. AB and CD are two equal chords of a circle with centre O which intersect each other at

right angle at P. If $OM \perp AB$ and $ON \perp CD$, show that $OMPN$ is a square.



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16. In the given diagram 'O' is the centre of the circle and AB is parallel to CD. $AB = 24$ cm and distance between the chord AB and CD is 17 cm. If the radius of the circle is 13 cm, find the length of the chord CD.



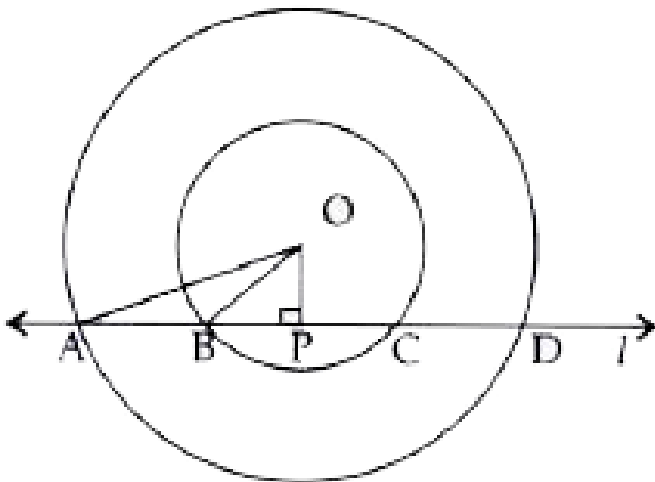
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17. In the given figure O is the centre of the two concentric circles. A line T cuts the circles at A, B, C and D as shown in the figure. OP is perpendicular to AD .

Given $OA = 34$ cm, $OP = 16$ cm and $AB = 18$ cm

Find :

length of chord AD





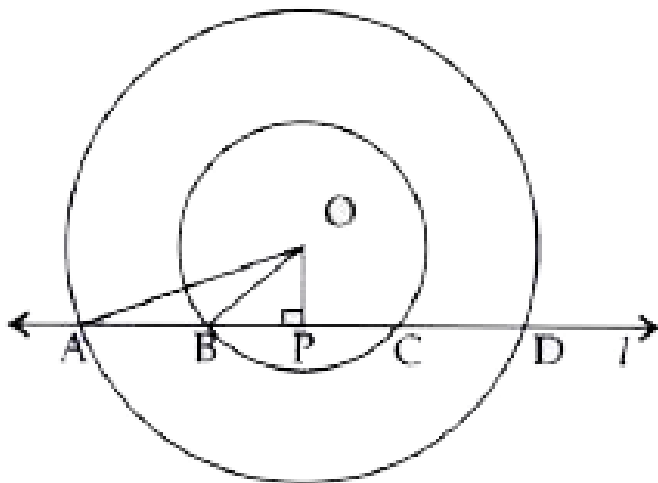
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18. In the given figure O is the centre of the two concentric circles. A line T cuts the circles at A, B, C and D as shown in the figure. OP is perpendicular to AD .

Given $OA = 34$ cm, $OP = 16$ cm and $AB = 18$ cm

Find :

length of chord BC



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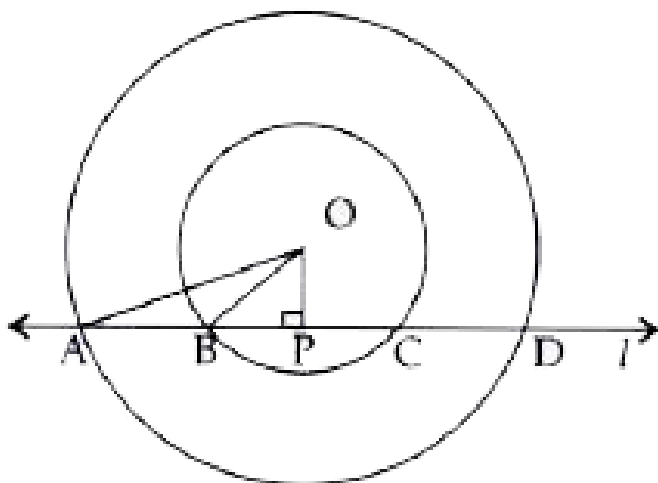
19. In the given figure O is the centre of the two concentric circles. A line l cuts the circles at A, B, C and D as shown in the figure. OP is

perpendicular to AD.

Given $OA = 34$ cm, $OP = 16$ cm and $AB = 18$ cm

Find :

radius of the smaller circle



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1. In the given figure, an equilateral triangle ABC is inscribed in a circle with centre O. Find :

$\angle BOC$



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2. In the given on equilateral triangle ABC is inscribed in a circle with centre O. Find:

$\angle OBC$ and $\angle BOC$



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3. In the given the length of arcs AB and BC are in the ratio 3:2.

If $\angle AOB = 96^\circ$ find

$\angle BOC$



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4. In the given the length of arcs AB and BC are in the ratio 3:2.

If $\angle AOB = 96^\circ$ find

$\angle ABC$



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5. Draw the circles of different radii. How many points, these circles can have in common ?
What is the maximum number of common points ?



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6. Suppose you are given a circle. Describe a method by which you can find the centre of this circle.



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7. The circumference of a circle, with centre O, is divided into three arcs APB, BQC and CRA

such that :

$$\frac{\text{arc}APB}{2} = \frac{\text{arc}BQC}{3} = \frac{\text{arc}CRA}{4}$$

Find

$\angle BOC$.



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8. In the given arc AB= twice arc BC and

$\angle AOB = 80^\circ$ find:

$\angle BOC$



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9. In the given arc $AB =$ twice arc BC and

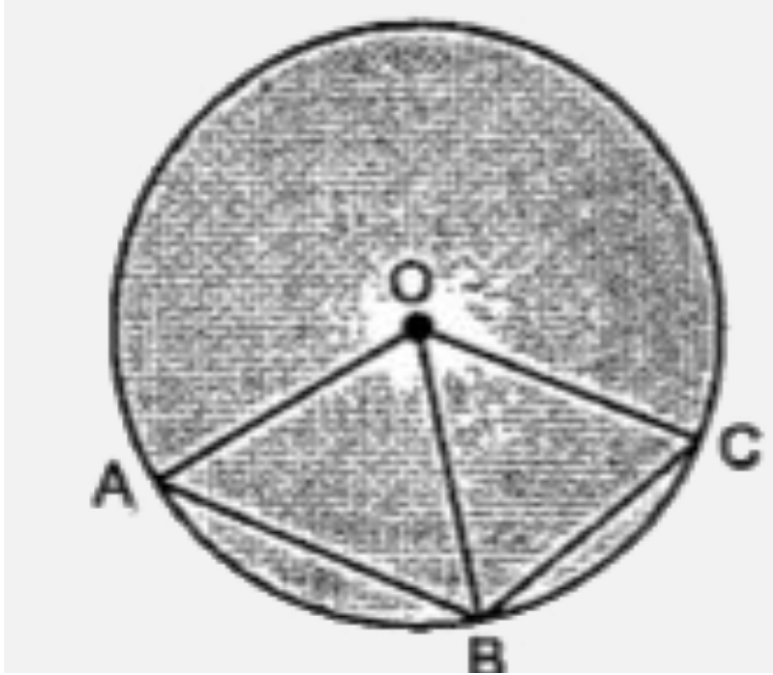
$\angle AOB = 80^\circ$ find:

$\angle OAC$



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10. In the given AB is a side of regular pentagon and BC is a side of regular hexagon.

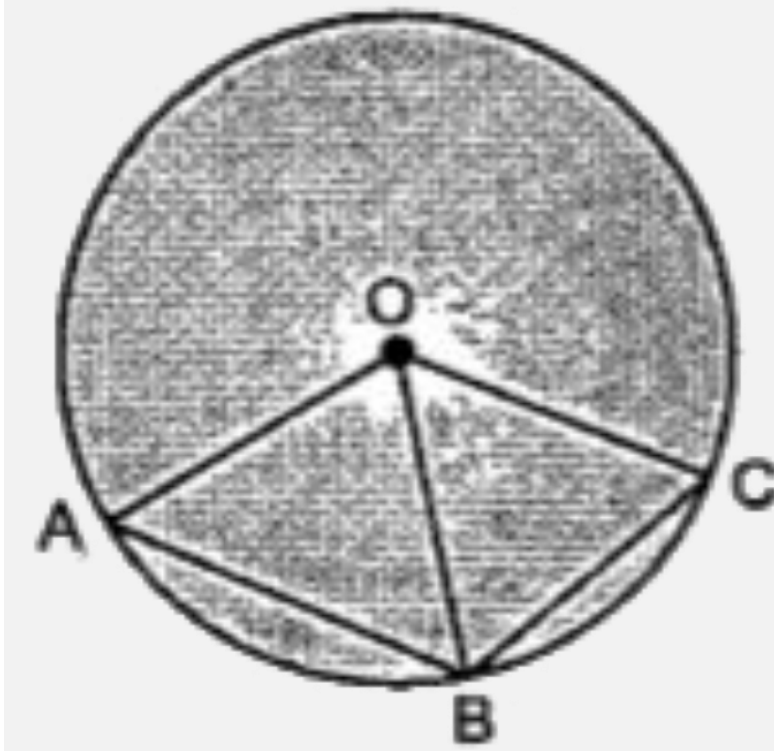


$\angle AOB$



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11. In the given AB is a side of regular pentagon and BC is a side of regular hexagon.

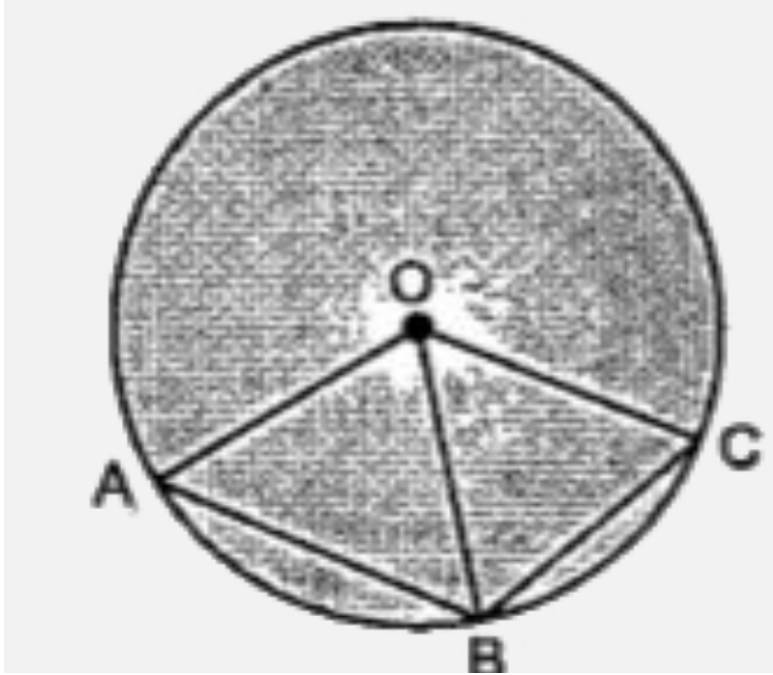


$\angle BOC$



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12. In the given AB is a side of regular pentagon and BC is a side of regular hexagon.

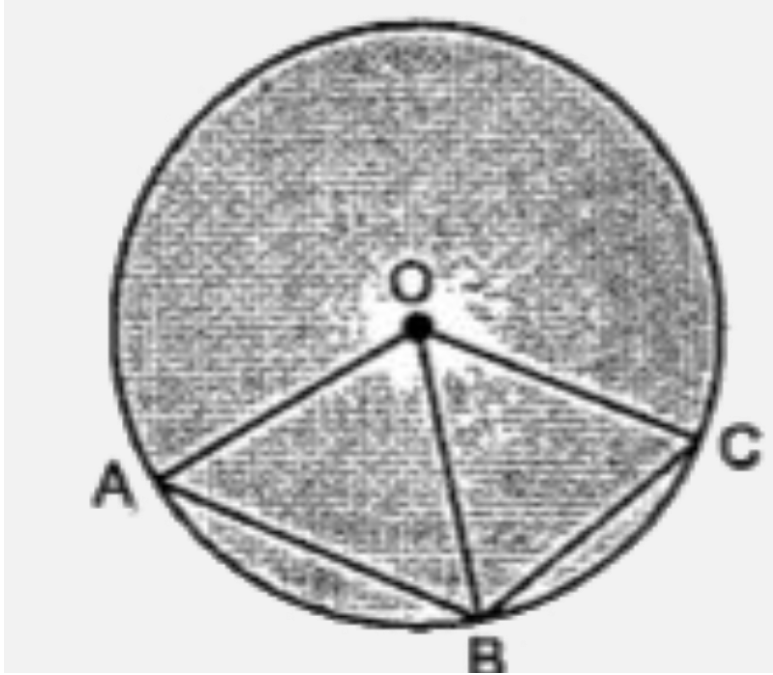


$\angle AOC$



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13. In the given AB is a side of regular pentagon and BC is a side of regular hexagon.

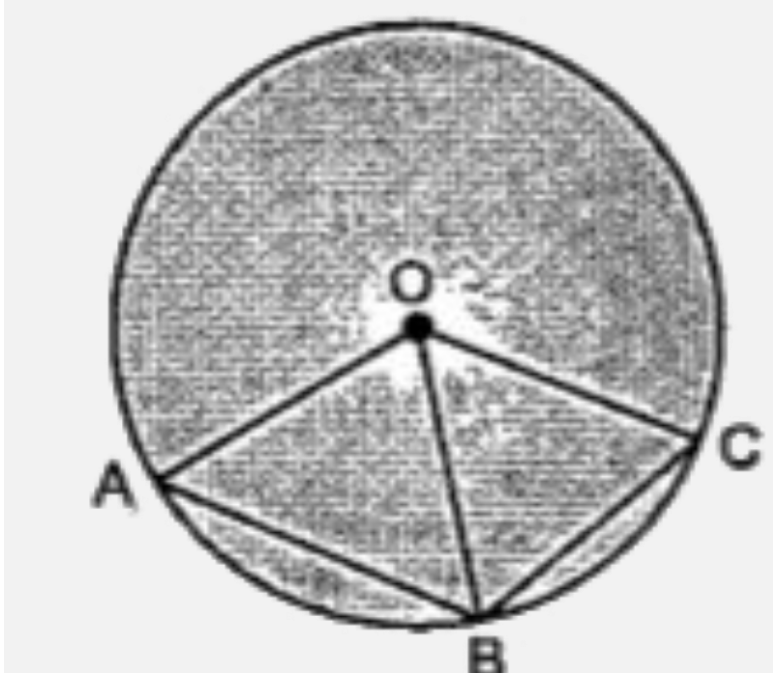


$\angle OBA$



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14. In the given AB is a side of regular pentagon and BC is a side of regular hexagon.

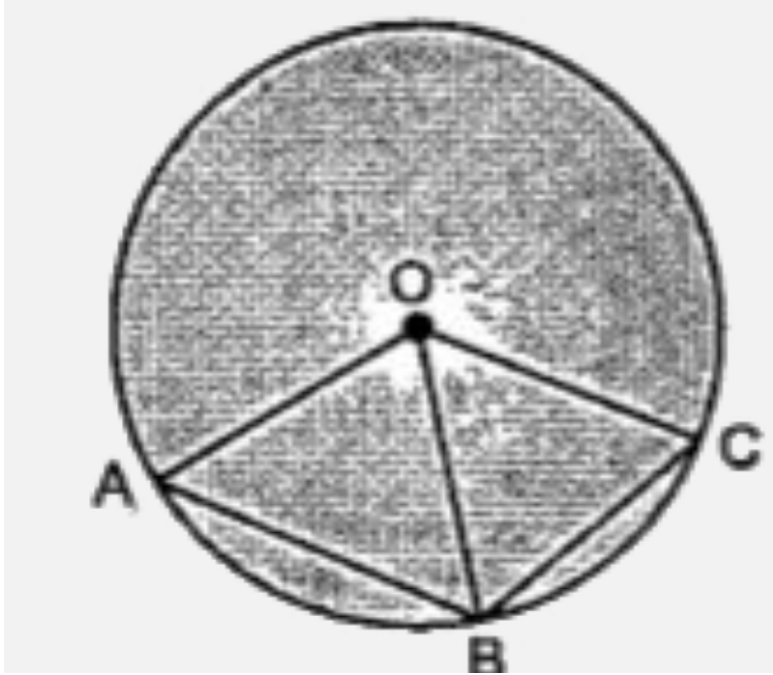


$\angle OBC$



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15. In the given AB is a side of regular pentagon and BC is a side of regular hexagon.



$\angle ABC$



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16. In the given

$AB = BC = DC$ and $\angle AOB = 50^\circ$

$\angle AOC$



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17. In the given

$AB = BC = DC$ and $\angle AOB = 50^\circ$

$\angle AOD$



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18. In the given

$AB = BC = DC$ and $\angle AOB = 50^\circ$

$\angle BOD$



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19. In the given figure, $AB = BC = DC$ and

$$\angle AOB = 50^\circ$$



$\angle OAC$



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20. In the given figure, $AB = BC = DC$ and

$$\angle AOB = 50^\circ$$



$\angle ODA$



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21. Prove that equal chords of congruent circles subtend equal angles at their centre.



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22. In the given figure, AB and CD are two equal chords of a circle, with centre O. If P is the mid-point of chord AB, Q is the mid-point of chord CD and $\angle POQ = 150^\circ$ find $\angle APQ$



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23. In the given figure, 'O' is the centre of the circle, Arc AB = Arc BC = Arc CD. If $\angle OAB = 48^\circ$, find :



(i) $\angle AOB$

(ii) $\angle BOD$



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24. In the given figure, 'O' is the centre of the circle, Arc AB = Arc BC = Arc CD. If

$\angle OAB = 48^\circ$, find :



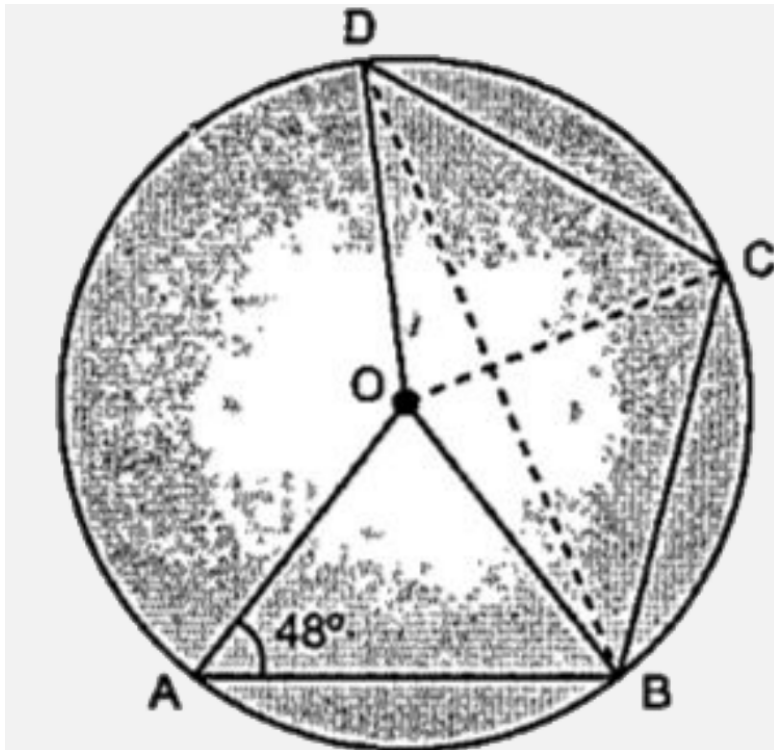
(i) $\angle AOB$

(ii) $\angle BOD$



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25. In the given 'O' is the centre of the circle, $\text{Arc } AB = \text{Arc } BC = \text{Arc } CD$. If $\angle OAB = 48^\circ$, find:



$\angle OBD$





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