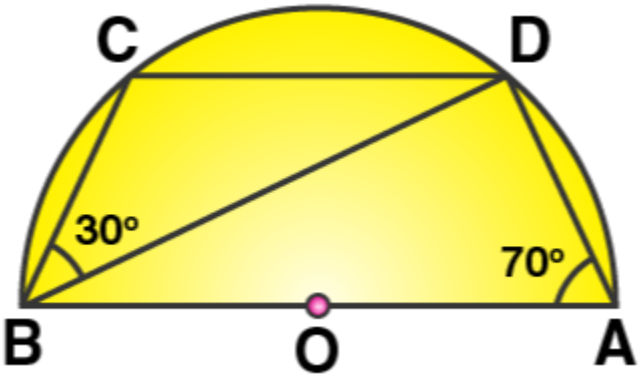
04 Feb 2024

Mathematics - Chapter 18 – Tangents and Intersecting Chords

Q1. OABC is a rhombus whose three vertices A, B and C lie on a circle with centre O.
i) If the radius of the circle is 10 cm, find the area of the rhombus.
ii) If the area of the rhombus is $32\sqrt{3}$ cm^2, find the radius of the circle.

Q2. The diameter and a chord of circle have a common end-point. If the length of the diameter is 20 cm and the length of the chord is 12 cm, how far is the chord from the center of the circle?

Q3. In the given figure, C and D are points on the semi-circle described on AB as diameter. Given angle BAD = 70o and angle DBC = 30o, calculate angle BDC.



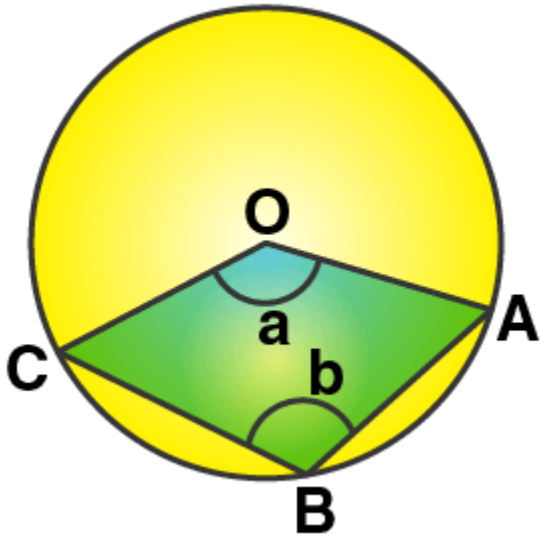
Q4. In cyclic quadrilateral ABCD, ∠A = 3 ∠C and ∠D = 5 ∠B. Find the measure of each angle of the quadrilateral.

<u>03 Feb 2024</u>

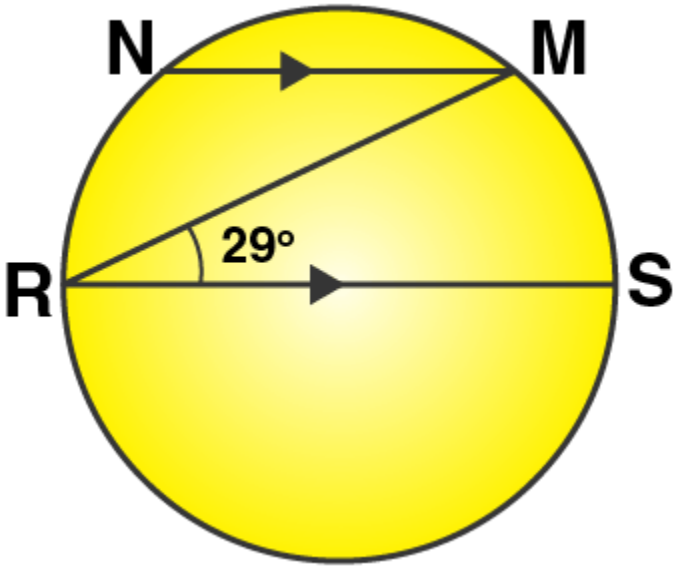
Mathematics - Chapter 17 – Circles

Q1. The figure given below, shows a circle with centre O.
Given: ∠AOC = a and ∠ABC = b.
(i) Find the relationship between a and b

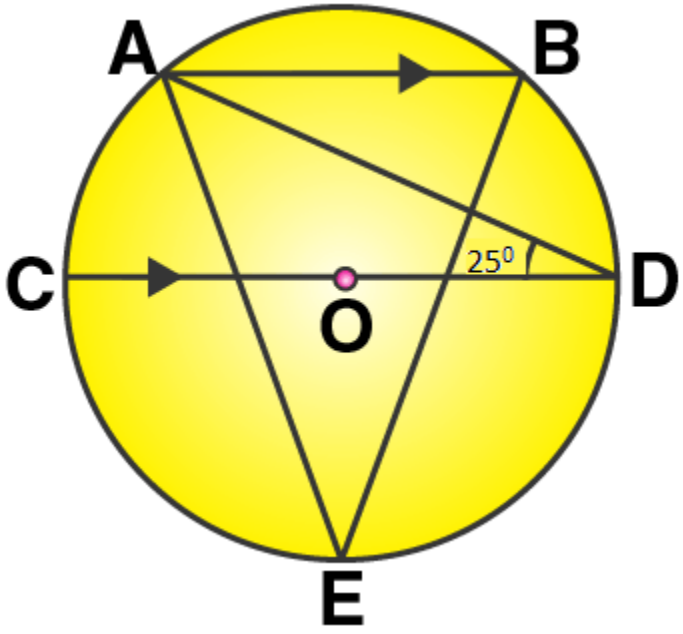
(ii) Find the measure of angle OAB, if OABC is a parallelogram.



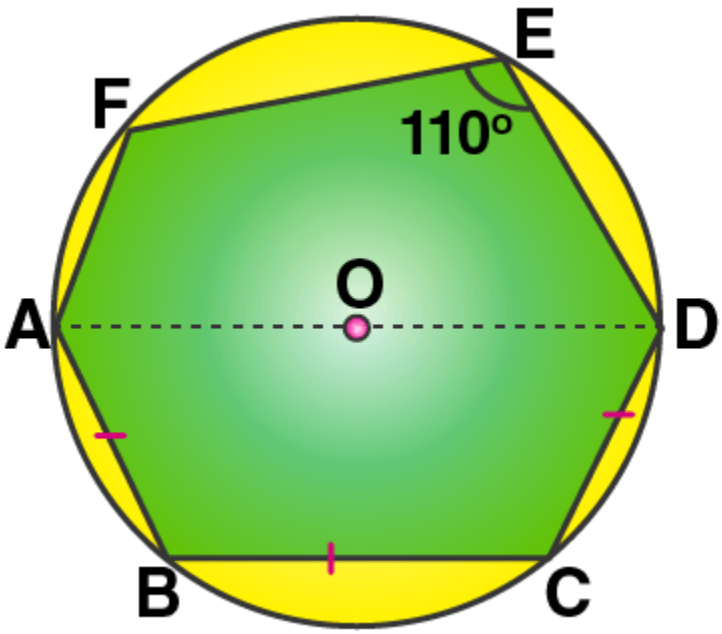
Q2. In the figure given RS is a diameter of the circle.
NM is parallel to RS and ∠MRS = 29°
Calculate: (i) ∠RNM; (ii) ∠NRM.



Q3. In the figure given alongside, AB || CD and O is the center of the circle.
If ∠ADC = 25°; find the angle AEB. Give reasons in support of your answer.



Q4. In the following figure, AD is the diameter of the circle with centre O. Chords AB, BC and CD are equal. If ∠DEF = 110°, calculate:
(i) ∠AFE, (ii) ∠FAB.



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Chapter 10 - Arithmetic Progression

Q1. The n^{th} term of sequence is (2n – 3), find its fifteenth term.
Q2. Find the 24^{th} term of the sequence: 12, 10, 8, 6,……
Q3. Find the 100^{th} term of the sequence: √3, 2√3, 3√3, ….
Q4. Find the 50^{th} term of the sequence: 1/n, (n+1)/n, (2n+1)/n, ……
Q5. Is 402 a term of the sequence: 8, 13, 18, 23,…….?
Q6. Find the sum of first 51 terms of an A.P. whose 2^{nd} and 3^{rd} terms are 14 and 18 respectively.

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Chapter 14 – Equation of a Line

Q1. Find, which of the following points lie on the line x – 2y + 5 = 0:

- **(i) (1, 3)**
- **(ii) (0, 5)**
- **(iii) (-5, 0)**
- **(iv) (5, 5)**
- **(v) (2, -1.5)**
- **(vi) (-2, -1.5)**

Q2. The line 3x/5 – 2y/3 + 1 = 0 contains the point (m, 2m – 1); calculate the value of m.

Q3. Find the slope of the line whose inclination is:

- **(i) 0°**
- **(ii) 30°**
- **(iii) $72^{\circ}\ 30'$**
- **(iv) 46°**

Q4. (-2, 4), (4, 8), (10, 7) and (11, -5) are the vertices of a quadrilateral. Show that the quadrilateral, obtained on joining the mid-points of its sides, is a parallelogram.

Q5. Find the equation of a line whose: y – intercept = 2 and slope = 3.

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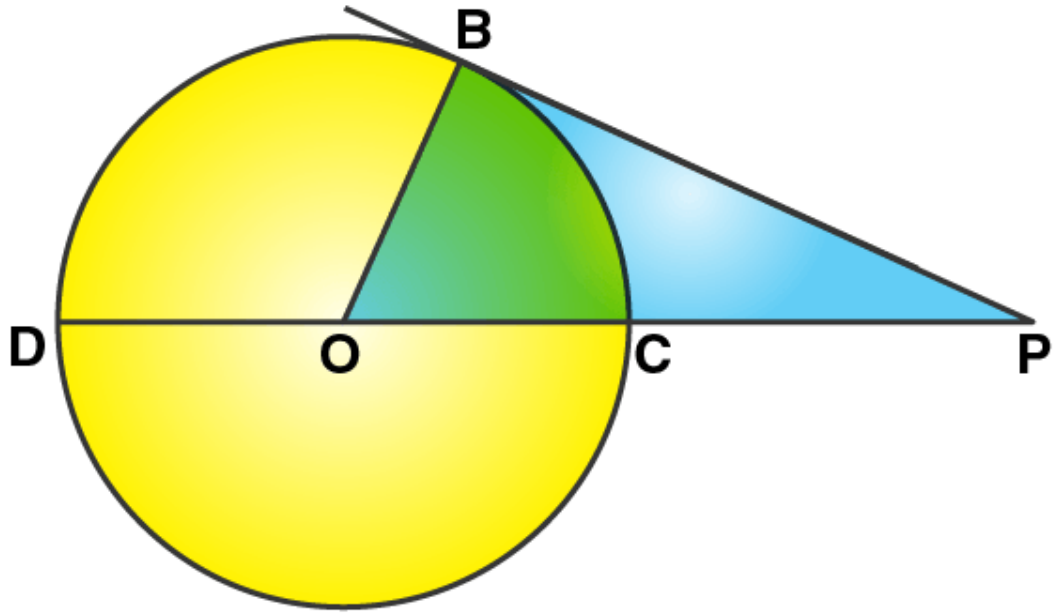
Chapter 18 – Tangents and Intersecting Chords

Q1. The radius of a circle is 8cm. Calculate the length of a tangent drawn to this circle from a point at a distance of 10cm from its centre.

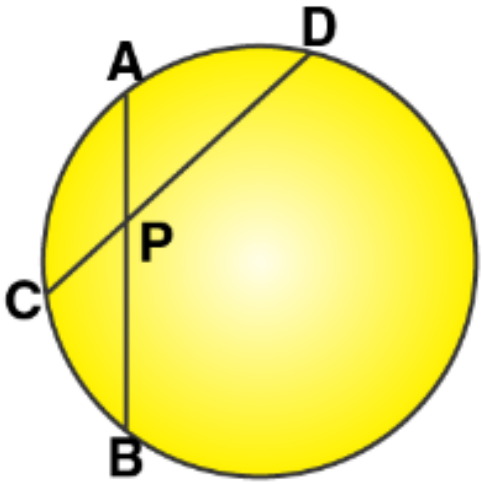
Q2. In the given figure, O is the centre of the circle and AB is a tangent to the circle at B. If AB = 15 cm and AC = 7.5 cm, calculate the radius of the circle.



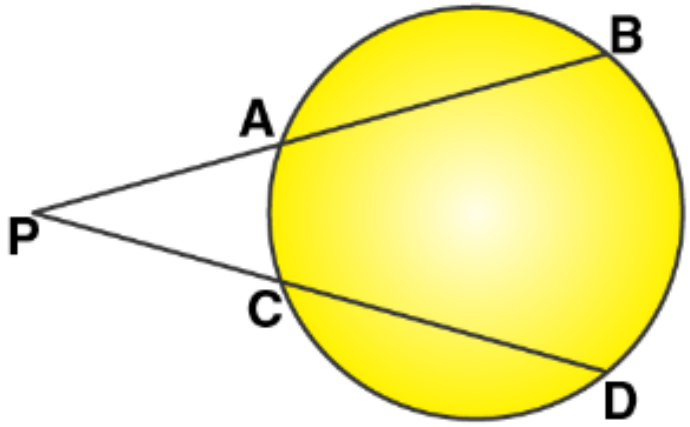
Q3. Three circles touch each other externally. A triangle is formed when the centers of these circles are joined together. Find the radii of the circles, if the sides of the triangle formed are 6 cm, 8 cm and 9 cm.

Q4.

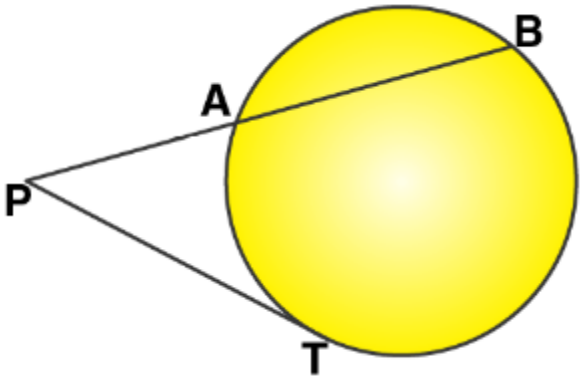
(i) In the given figure, 3 x CP = PD = 9 cm and AP = 4.5 cm. Find BP.



(ii) In the given figure, 5 x PA = 3 x AB = 30 cm and PC = 4cm. Find CD.



(iii) In the given figure, tangent PT = 12.5 cm and PA = 10 cm; find AB.


B
A
P
T

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Chapter 8 – Remainder and Factor Theorems

Q1. Find, in each case, the remainder when:

(i) $x^4 – 3x^2 + 2x + 1$ is divided by $x – 1$.

(ii) $x^3 + 3x^2 – 12x + 4$ is divided by $x – 2$.

(ii) $x^4 + 1$ is divided by $x + 1$.

Q2.

(i) If $2x + 1$ is a factor of $2x^2 + ax – 3$, find the value of a.

(ii) Find the value of k, if $3x – 4$ is a factor of expression $3x^2 + 2x – k$.

Q3. Find the values of m and n so that $x – 1$ and $x + 2$ both are factors of $x^3 + (3m + 1) x^2 + nx – 18$.

Q4. Using the Factor Theorem, show that:

(i) $(x – 2)$ is a factor of $x^3 – 2x^2 – 9x + 18$. Hence, factorise the expression $x^3 – 2x^2 – 9x + 18$ completely.

(ii) $(x + 5)$ is a factor of $2x^3 + 5x^2 – 28x – 15$. Hence, factorise the expression $2x^3 + 5x^2 – 28x – 15$ completely.

(iii) $(3x + 2)$ is a factor of $3x^3 + 2x^2 – 3x – 2$. Hence, factorise the expression $3x^3 + 2x^2 – 3x – 2$ completely.

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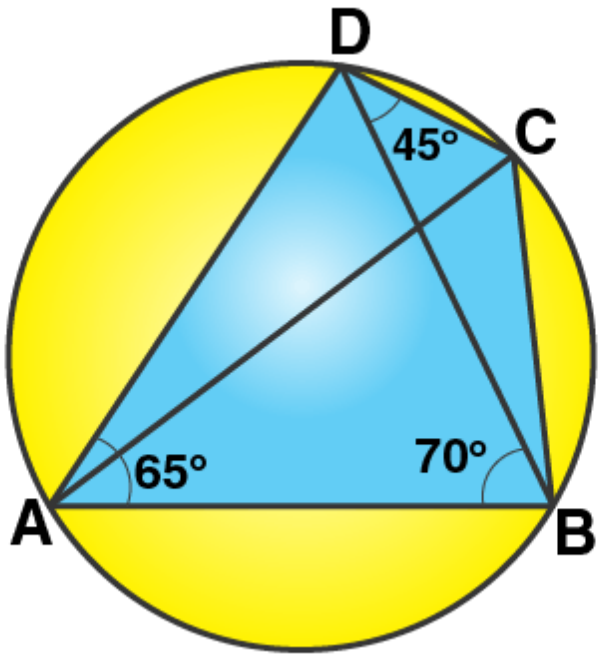
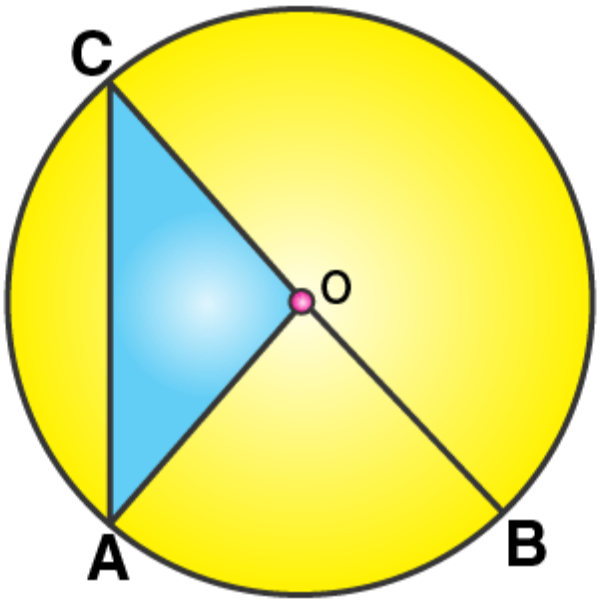
Chapter 17 – Circles

Q1. In the given figure, ∠BAD = 65°, ∠ABD = 70°, ∠BDC = 45°



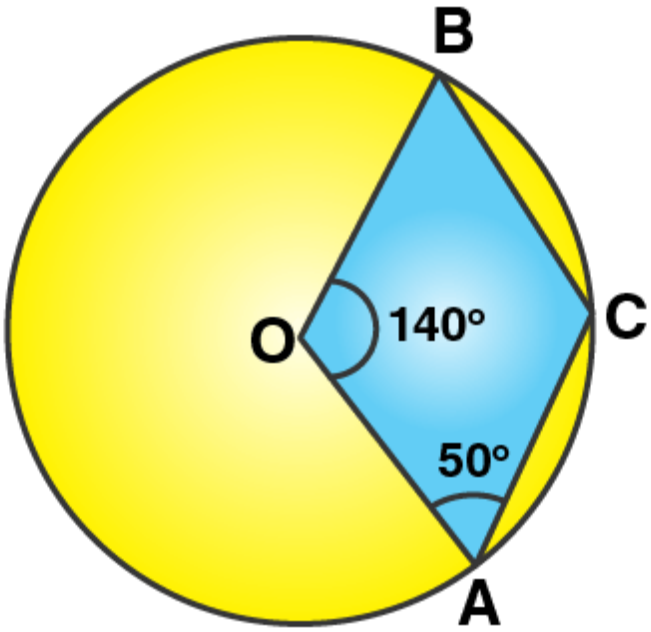
(i) Prove that AC is a diameter of the circle.
(ii) Find ∠ACB.

Q2. Given O is the centre of the circle and ∠AOB = 70^{o}.



Calculate the value of:
(i) $\angle OCA$,
(ii) $\angle OAC$.

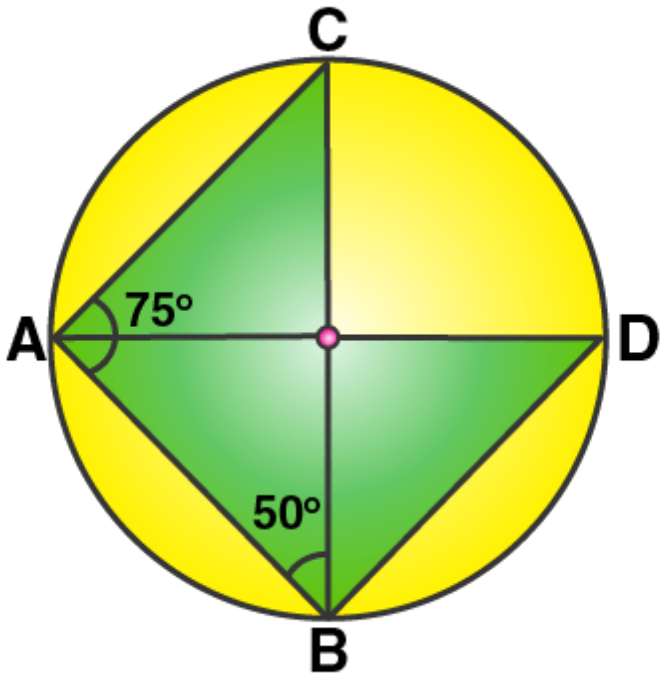
Q3. In the figure, given below, O is the centre of the circle. If $\angle AOB = 140^{o}$ and $\angle OAC = 50^{o}$;



find:

(i) ∠ACB,
(ii) ∠OBC,
(iii) ∠OAB,
(iv) ∠CBA.

Q4. Given: ∠CAB = 75° and ∠CBA = 50°. Find the value of ∠DAB + ∠ABD.



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Chapter 9 – Matrices

Q1. If A = [8 -3] and B = [4 -5]; find:

(i) A + B (ii) B – A

Q2. Find x and y if:

(i) 3[4 x] + 2[y -3] = [10 0]

(ii) $$x\begin{bmatrix}-1\\2\end{bmatrix}-4\begin{bmatrix}-2\\y\end{bmatrix}=\begin{bmatrix}7\\-8\end{bmatrix}$$

Q3. Evaluate: if possible:

$$(i)\ \begin{bmatrix}3 & 2\end{bmatrix}\begin{bmatrix}2\\0\end{bmatrix}$$

$$(ii)\ \begin{bmatrix}1 & -2\end{bmatrix}\begin{bmatrix}-2 & 3\\-1 & 4\end{bmatrix}$$

$$(iii)\ \begin{bmatrix}6 & 4\\3 & -1\end{bmatrix}\begin{bmatrix}-1\\3\end{bmatrix}$$

$$(iv)\ \begin{bmatrix}6 & 4\\3 & -1\end{bmatrix}\begin{bmatrix}-1 & 3\end{bmatrix}$$

Q4. If $A=\begin{bmatrix}0 & 2\\5 & -2\end{bmatrix}, B=\begin{bmatrix}1 & -1\\3 & 2\end{bmatrix}$

and I is a unit matrix of order 2×2, find:

(i) AB (ii) BA (iii) AI

(iv) IB (v) A^2 (iv) B^2A