



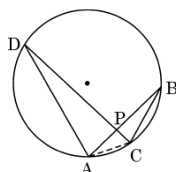
Chapter 10: Circles

Important PYQs — Board 2023 & 2024

52 previous-year board questions · ★ marks the 6 that were repeated (same question asked again, or in both years).

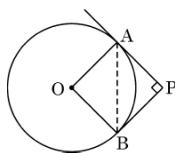
1 Mark – MCQ

Q1. AB and CD are two chords of a circle intersecting at P. Choose the correct statement from the following:
[BOARD 2024]



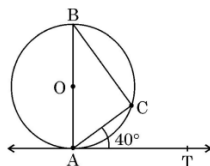
- a) $\triangle ADP \sim \triangle CBA$ b) $\triangle ADP \sim \triangle BPC$ c) $\triangle ADP \sim \triangle BCP$ d) $\triangle ADP \sim \triangle CBP$

Q2. In the given figure, tangents PA and PB to the circle centered at O, from point P are perpendicular to each other. If PA = 5 cm then length of AB is [BOARD 2024]



- a) 5 cm b) $5\sqrt{2}$ cm c) $2\sqrt{5}$ cm d) 10 cm

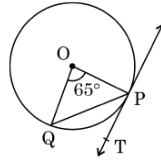
Q3. In the given figure, AT is tangent to a circle centered at O. If $\angle CAT = 40^\circ$ then $\angle CBA$ is equal to [BOARD 2024]



- a) 70° b) 50° c) 65° d) 40°



Q4. In the given figure, PT is tangent to a circle with centre O. Chord PQ subtends an angle of 65° at the centre. The measure of $\angle QPT$ is [BOARD 2023 & BOARD 2024] ★ Repeated

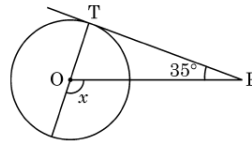


- a) 65° b) 57.5° c) 67.5° d) 32.5°

Q5. The maximum number of common tangents that can be drawn to two circles intersecting at two distinct points is [BOARD 2024]

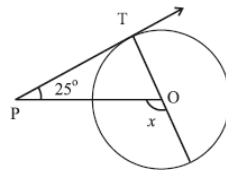
- a) 4 b) 3 c) 2 d) 1

Q6. In the given figure, if PT is a tangent to a circle with centre O and $\angle TPO = 35^\circ$ then the measure of $\angle x$ is [BOARD 2024]



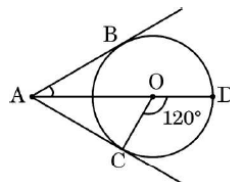
- a) 110° b) 115° c) 120° d) 125°

Q7. In the given figure, PT is a tangent at T to the circle with centre O. If $\angle TPO = 25^\circ$ then x is [BOARD 2023]



- a) 25° b) 65° c) 90° d) 115°

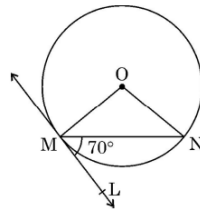
Q8. In the given figure, AC and AB are tangents to a circle centered at O. If $\angle COD = 120^\circ$ then $\angle BAO$ is [BOARD 2023]



- a) 30° b) 60° c) 45° d) 90°



Q9. In the given figure, O is the centre of the circle. MN is the chord and the tangent ML at point M makes an angle of 70° with MN. The measure of $\angle MON$ is [BOARD 2024]

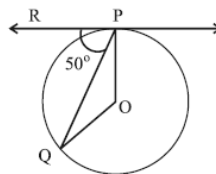


- a) 120° b) 140° c) 70° d) 90°

Q10. If an arc subtends an angle of 90° at the centre of a circle, then the ratio of its length to the circumference of the circle is [BOARD 2024]

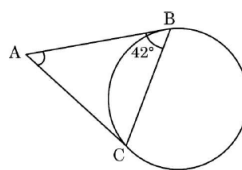
- a) 2:3 b) 1:4 c) 4:1 d) 1:3

Q11. In the given figure, O is the centre of the circle and PQ is the chord. If the tangent PR at P makes an angle of 50° with PQ, then the $\angle POQ$ is [BOARD 2023]



- a) 50° b) 40° c) 100° d) 130°

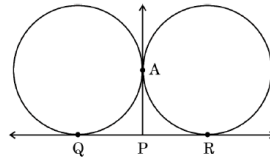
Q12. In the given figure, AB and AC are tangents to the circle. If $\angle ABC = 42^\circ$ then the measure of $\angle BAC$ is [BOARD 2024]



- a) 96° b) 42° c) 106° d) 86°



Q13. In the given figure, QR is the common tangent to the two given circles touching externally at A. The tangent at A meets QR at P. If $AP = 4.2$ cm then the length of QR is **[BOARD 2024]**

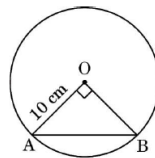


- a) 4.2 cm b) 2.1 cm c) 8.4 cm d) 6.3 cm

Q14. The area of the square inscribed in a circle of radius $5\sqrt{2}$ cm is **[BOARD 2024]**

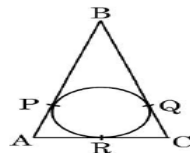
- a) 50 cm^2 b) 100 cm^2 c) 25 cm^2 d) 200 cm^2

Q15. A chord of a circle of radius 10 cm subtends a right angle at its centre. The length of the chord (in cm) is **[BOARD 2024]**



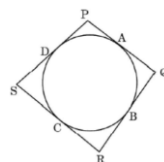
- a) $5\sqrt{2}$ b) $10\sqrt{2}$ c) $5/\sqrt{2}$ d) 5

Q16. In the given figure, $AB = BC = 10$ cm. If $AC = 7$ cm, then the length of BP is **[BOARD 2023]**



- a) 3.5 cm b) 7 cm c) 6.5 cm d) 5 cm

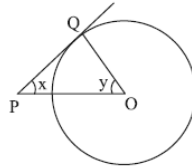
Q17. In the given figure, the quadrilateral PQRS circumscribes a circle. Here $PA + CS$ is equal to **[BOARD 2023]**



- a) QR b) PR c) PS d) PQ



Q18. In the given figure, PQ is a tangent to the circle with centre O. If $\angle OPQ = x$, $\angle POQ = y$ then $x + y$ is [BOARD 2023]

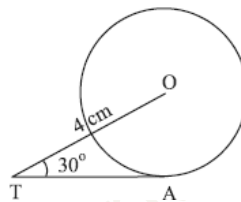


- a) 45° b) 90° c) 60° d) 180°

Q19. The length of tangent drawn to a circle of radius 9 cm from a point 41 cm from the centre is: [BOARD 2023]

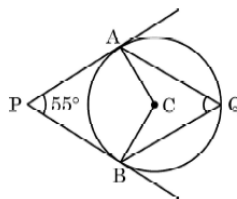
- a) 40 cm b) 9 cm c) 41 cm d) 50 cm

Q20. In the given figure, TA is a tangent to the circle with centre O such that $OT = 4$ cm, $\angle OTA = 30^\circ$ then length of TA is [BOARD 2023]



- a) $2\sqrt{3}$ cm b) 2 cm c) $2\sqrt{2}$ cm d) $\sqrt{3}$ cm

Q21. In the given figure, PA and PB are tangents from an external point P to circle with centre C and Q is any point on the circle. Then the measure of $\angle AQB$ is [BOARD 2023]



- a) 62.5° b) 125° c) 55° d) 90°



1 Mark – Assertion & Reasoning

Q1. Assertion (A): The tangents drawn at the end points of a diameter of a circle, are parallel.

Reason (R): Diameter of a circle is the longest chord. [BOARD 2024]

Q2. Assertion (A): A tangent to a circle is perpendicular to the radius through the point of contact.

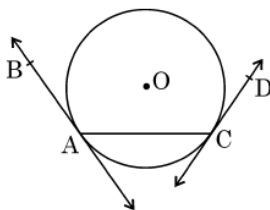
Reason (R): The length of the tangents drawn from an external point to a circle are equal. [BOARD 2023]

Q3. Assertion (A): If PA and PB are tangents drawn from an external point P to a circle with centre O, then the quadrilateral AOBP is cyclic.

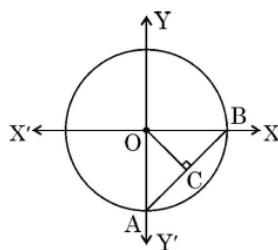
Reason (R): The angle between two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre. [BOARD 2023]

2 Marks

Q1. In the given figure, AB and CD are tangents to a circle centered at O. Is $\angle BAC = \angle DCA$? Justify your answer. [BOARD 2024]



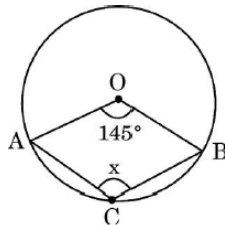
Q2. In the given figure, a circle centered at O has radius 7 cm, OC is median of $\triangle OAB$. Find the length of median OC. [BOARD 2024]



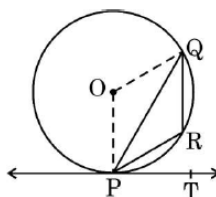


Q3. From an external point P, two tangents PA and PB are drawn to the circle with centre O. Prove that OP is the perpendicular bisector of chord AB. **[BOARD 2024]**

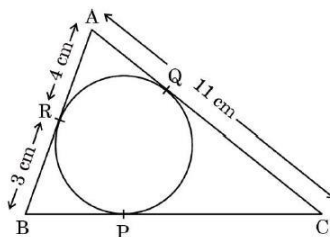
Q4. In the given figure, O is the centre of the circle. If $\angle AOB = 145^\circ$ then find the value of x. **[BOARD 2024]**



Q5. In the given figure, PQ is a chord of the circle centered at O. PT is a tangent to a circle at P. If $\angle QPT = 55^\circ$ then find $\angle PRQ$. **[BOARD 2023]**



Q6. In the given figure, $\triangle ABC$ is circumscribing a circle. Find the length of BC, if AR = 4 cm, BR = 3 cm and AC = 11 cm. **[BOARD 2024]**

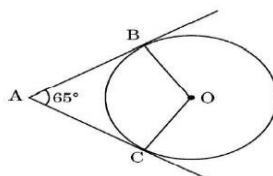


Q7. If two tangents inclined at an angle of 60° are drawn to a circle of radius 3 cm, then find the length of each tangent. **[BOARD 2024]**

Q8. Prove that the tangents drawn at the ends of a diameter of a circle are parallel. **[BOARD 2023 & BOARD 2024]**

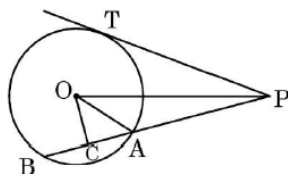
★ Repeated

Q9. In the given figure, O is the centre of the circle. AB and AC are tangents drawn to the circle from point A. If $\angle BAC = 65^\circ$, then find the measure of $\angle BOC$. **[BOARD 2023]**

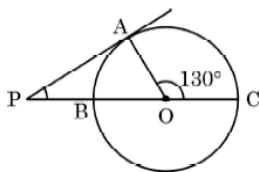




Q10. In the given figure, PT is a tangent to the circle centered at O. OC is the perpendicular to chord AB. Prove that $PA \cdot PB = PC^2 - AC^2$. [BOARD 2023]

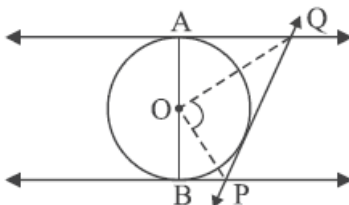


Q11. In the given figure, PA is a tangent to the circle drawn from the external point P and PBC is the secant to the circle with BC as diameter. If $\angle AOC = 130^\circ$ then find $\angle APB$. [BOARD 2023]

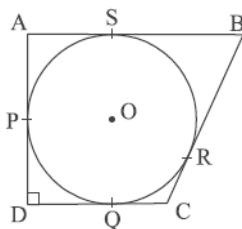


3 Marks

Q1. In the given figure, AB is a diameter of the circle with centre O. AQ, BP and PQ are tangents to the circle. Prove that $\angle POQ = 90^\circ$. [BOARD 2024]

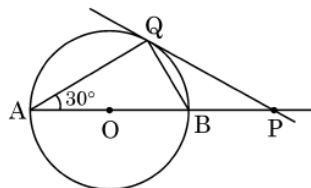


Q2. A circle with centre O and radius 8 cm is inscribed in a quadrilateral ABCD in which P, Q, R, S are the points of contact as shown. If AD is perpendicular to DC, $BC = 30$ cm and $BS = 24$ cm then find the length DC. [BOARD 2024]

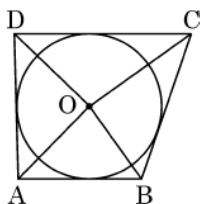




Q3. In the given figure, PQ is tangent to a circle centered at O and $\angle BAQ = 30^\circ$. Show that $BP = BQ$. **[BOARD 2024]**



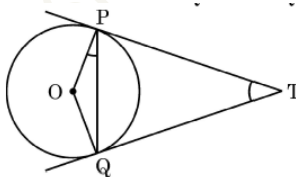
Q4. In the given figure, AB, BC, CD and DA are tangents to the circle with centre O forming a quadrilateral ABCD. Show that $\angle AOB + \angle COD = 180^\circ$. **[BOARD 2024]**



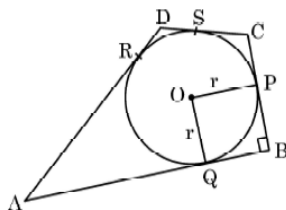
Q5. Prove that the tangents drawn at the end points of a chord of a circle makes equal angles with the chord. **[BOARD 2024]**

Q6. Prove that parallelogram circumscribing a circle is a rhombus. **[BOARD 2024] ★ Repeated**

Q7. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$. **[BOARD 2023] ★ Repeated**

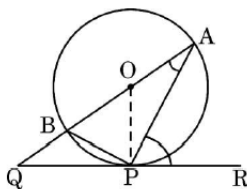


Q8. In the given figure, a circle is inscribed in a quadrilateral ABCD in which $\angle B = 90^\circ$. If $AD = 17$ cm, $AB = 20$ cm and $DS = 3$ cm then find the radius of the circle. **[BOARD 2023]**





Q9. In the given figure, O is the centre of the circle and QPR is a tangent to it at P. Prove that $\angle QAP + \angle APR = 90^\circ$. [BOARD 2023]

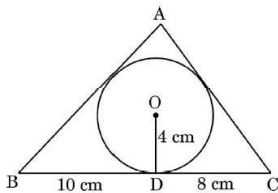


Q10. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre. [BOARD 2023]

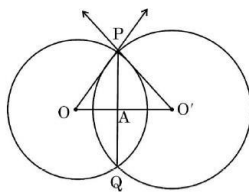
Q11. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle. [BOARD 2023]

5 Marks

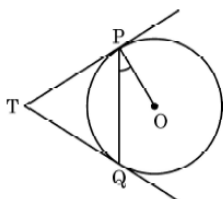
Q1. A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC are of lengths 10 cm and 8 cm respectively. Find the lengths of the sides AB and AC, if it is given that area $\Delta ABC = 90 \text{ cm}^2$. [BOARD 2023]



Q2. Two circles with centres O and O' of radii 6 cm and 8 cm respectively intersect at two points P and Q such that OP and O'P are tangents to the two circles. Find the length of the common chord PQ. [BOARD 2023]

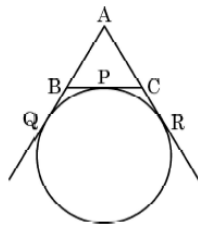


Q3. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$. [BOARD 2023] ★ Repeated



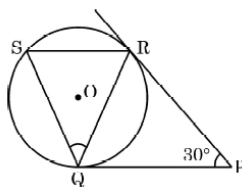


Q4. A circle touches the side BC of $\triangle ABC$ at a point P and touches AB and AC when produced at Q and R respectively. Show that $AQ = \frac{1}{2}(\text{Perimeter of } \triangle ABC)$. [BOARD 2023]



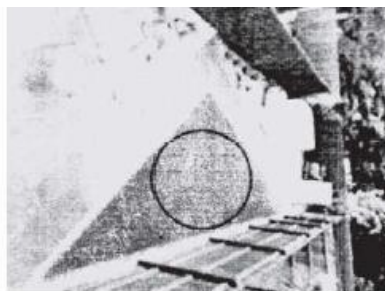
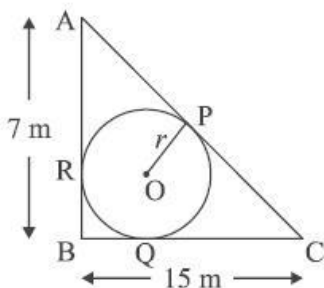
Q5. Prove that parallelogram circumscribing a circle is a rhombus. [BOARD 2023] ★ Repeated

Q6. In the given figure, tangents PQ and PR are drawn to a circle such that $\angle RPQ = 30^\circ$. A chord RS is drawn parallel to the tangent PQ. Find the $\angle RQS$. [BOARD 2023]



Case Based Question

Q1. A backyard is in the shape of a triangle ABC with right angle at B. $AB = 7$ cm and $BC = 15$ cm. A circular pit was dug inside it such that it touches the walls AC, BC and AB at P, Q and R respectively such that $AP = x$ m. [BOARD 2024]



Based on the above information, answer the following questions:

- (i) Find the length of AR in terms of x. [1]
- (ii) (a) Find the length PC in term of x and hence find the value of x. [2]

OR

- (b) Find x and hence find the radius r of the circle. [2]
- (iii) Write the type of quadrilateral BQOR. [1]