

NEW STANDARD ACADEMY

Marks: 80

Date : 24-11-25

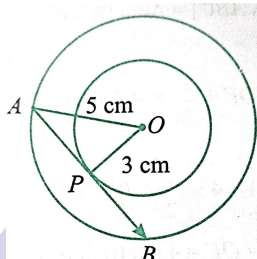
CLASS : 10TH MATHS

Time: 3 hours

SECTION-A

Multiple choice questions

1. In given Fig. the length PB = _____ cm.



- (a) 9 cm (b) 4 cm
(c) 15 cm (d) 7 cm

2. A circle has a centre O and radii OQ and OR. Two tangents, PQ and PR, are drawn from an external point, P.

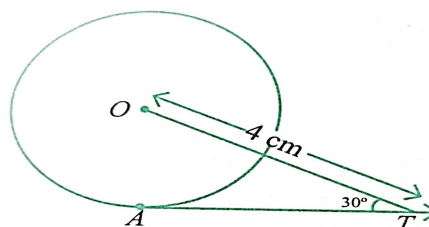
In addition to the above information, which of these must also be known to conclude that the quadrilateral PQOR is a square?

- (i) OQ and OR are at an angle of 90° .
(ii) The tangents meet at an angle of 90° .
(a) only (i) (b) only (ii)
(c) either (i) or (ii) (d) both (i) and (ii)

3. Which of the following statements is not true?

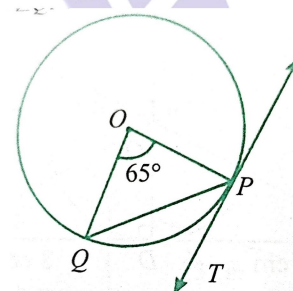
- (a) A number of secants can be drawn at any point on the circle.
(b) Only one tangent can be drawn at any point on a circle.
(c) A chord is a line segment joining two points on the circle
(d) From a point inside a circle only two tangents can be drawn.

4. In the figure, AT is a tangent to the circle with centre O such that OT=4 cm and $\angle OTA = 30^\circ$. Then AT is equal to



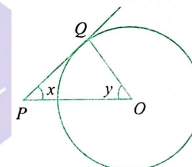
- (a) 4 cm (b) 2 cm
(c) $2\sqrt{3}$ cm (d) $4\sqrt{3}$ cm

5. 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:



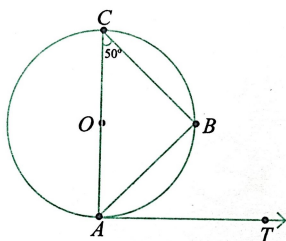
- (a) 65° (b) 57.5°
(c) 67.5° (d) 32.5°

6. 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:



- (a) 45° (b) 90°
(c) 60° (d) 180°

7. In the figure, AB is a chord of the circle and AOC is its diameter such that $\angle ACB = 50^\circ$. If AT is the tangent to the circle at the point A, then $\angle BAT$ is equal to

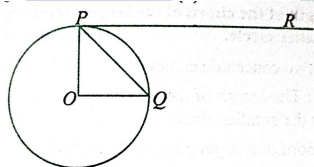


- (a) 65° (b) 60°
(c) 50° (d) 40°

8. At one end A of a diameter AB of a circle of radius 5 cm, tangent XAY is drawn to the circle. The length of the chord CD parallel to XY and at a distance 8 cm from A is

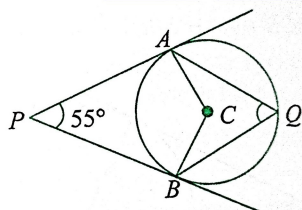
- (a) 4 cm (b) 5 cm
(c) 6 cm (d) 8 cm

9. If O is centre of a circle and Chord PQ makes an angle 50° with the tangent PR at the point of contact P, then the angle subtended by the chord at the centre is



- (a) 130° (b) 100°
(c) 50° (d) 30°

10. In the given figure, PA and PB are tangents from external point P to a circle with centre C and Q is any point on the circle. Then the measure of angle AQB is:

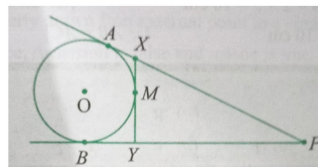


- (a) $62\frac{1}{2}^\circ$ (b) 125° (c) 55°
(d) 90°

11. If two tangents are drawn to a circle from an external point, and the angle between the tangents is 60° , then the ratio of the lengths of the tangents is:

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

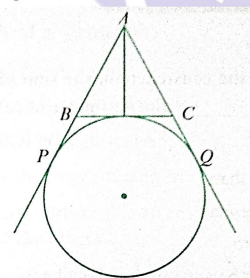
12. In the figure below, APXY is formed using three tangents to a circle centred at O.



Based on the construction, the sum of the tangents PA and PB is the perimeter of triangle PXY.

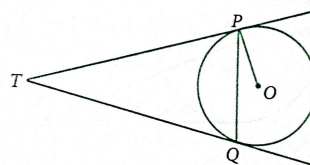
- (a) lesser than (b) greater than
(c) equal to (d) cannot be answered without knowing the tangent

13. In the given figure, AP, AQ and BC are tangents to the circle. If AB = 5 cm AC = 6 cm and BC = 4 cm then the length of AP is



- (a) 7.2 cm (b) 7.5 cm
(c) 8.5 cm (d) 9.2 cm

14. In Fig., two tangents TP and TQ are drawn to a circle with centre O from an external point T. Then angle PTQ is

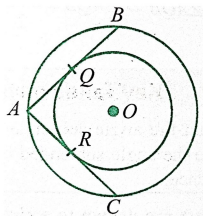


- (a) angle OPQ (b) 2 angle OPQ
(c) angle OQP (d) 2 angle OQP

15. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at angle of 80° , then is equal to angle POA

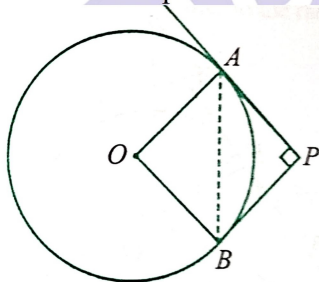
- (a) 50° (b) 60°
(c) 70° (d) 80°

16. In Fig., there are two concentric circles with centre O. If ARC and AQB are tangents to the smaller circle from the point A lying on the larger circle, what is the length of AC, if AQ = 5 cm?



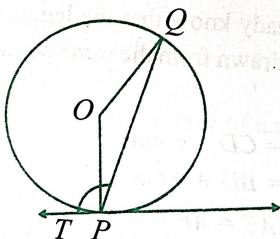
- (a) 40 cm (b) 20 cm
(c) 15 cm (d) 10 cm

17. In the given figure, tangents PA and PB to the circle centred at O, from point P are perpendicular to each other. If PA = 5 cm, then length of AB is equal to.



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

18. In the given figure, a tangent has been drawn at a point P on the circle centred at O.



If angle TPQ = 110 deg then angle POQ is equal to

- (a) 110° (b) 70°
(c) 140° (d) 55°

Assertion and Reason

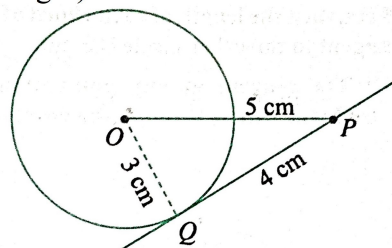
Direction: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:

- (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

19. **Assertion (A):** If in a circle with centre O, the radius of the circle is 3 cm and distance

of a point P, from the centre of a circle is 5 cm, then length of tangent PQ, where Q is a point on the circle, will be 4 cm.

Reason (R): (hypotenuse)² = (base)² + (height)²

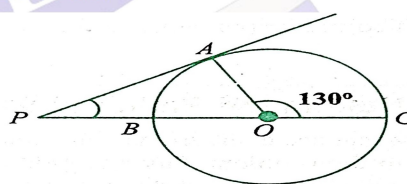


20. **Assertion (A):** If one angle in a cyclic quadrilateral is 40° , then the opposite angle is 140° .

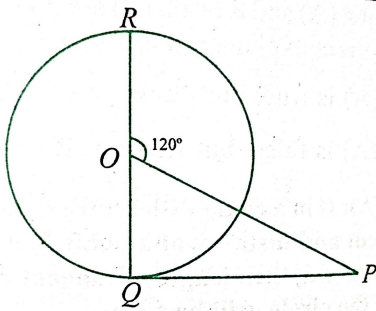
Reason (R): Sum of opposite angles in a cyclic quadrilateral is 360° .

SECTION-B

21. 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.
22. If the angle between two tangents drawn from an external point P to a circle of radius a and centre O, is 60° , then find the length of OP.
23. 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 the measure of $\angle APB$, where O is the centre of the circle.

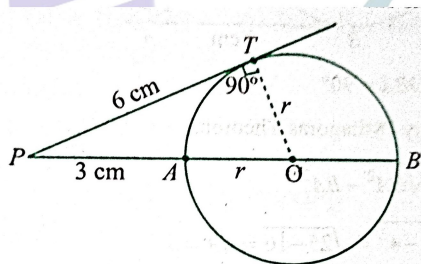


24. Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.
25. PO is a tangent drawn from an external point P to a circle with centre O and OOR is the diameter of the circle. If angle POR = 120° , What is the measure of $\angle OPQ$?

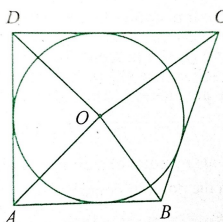


SECTION-C

26. From an external point P, two tangents, PA and PB are drawn to a circle with centre O. At a point E on the circle, a tangent is drawn to intersect PA and PB at C and D, respectively. If PA = 10 cm, find the perimeter of triangle PCD.
27. In the figure, O is the centre of the circle and PT is the tangent drawn from the point P to the circle. Secant PAB passes through the centre O of the circle. If PT = 6 cm and PA = 3 cm, then find the radius of the circle.



28. Prove that a diameter AB of a circle bisects all those chords which are parallel to the tangent at the point A.
29. A circle touches all the four sides of a quadrilateral ABCD. Prove that $AB + CD = BC + DA$.
30. In the given figure, AB, BC, CD and DA are tangents to the circle with centre O forming a quadrilateral ABCD. Show that $\angle AOB + \angle COD = 180^\circ$.

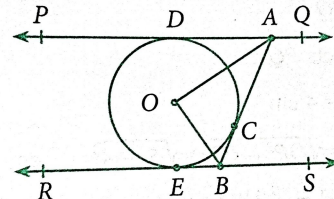


31. A is a point at a distance 13 cm from the centre O of a circle of radius 5 cm. AP and

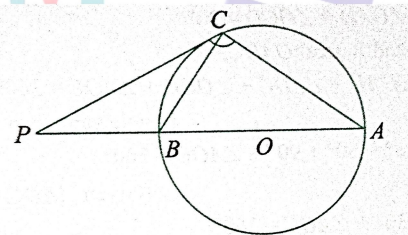
AQ are the tangents to the circle at P and Q. If a tangent BC is drawn at a point R lying on the minor arc PQ to intersect AP at B and AQ at C, find the perimeter of the $\triangle ABC$.

SECTION-D

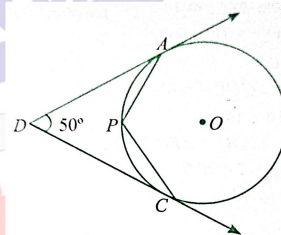
32. In Figure, PQ and RS are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting PQ at A and RS at B. Prove that $\angle AOB = 90^\circ$.



33. In Figure, PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q meet at a point T. Find the length of TP.
34. The tangent at a point C of a circle and a diameter AB when extended intersect at P. If $\angle PCA = 110^\circ$ find $\angle CBA$.



35. In the given figure, O is the center of the circle. Determine $\angle APC$, if DA and DC are tangents and $\angle ADC = 50^\circ$.

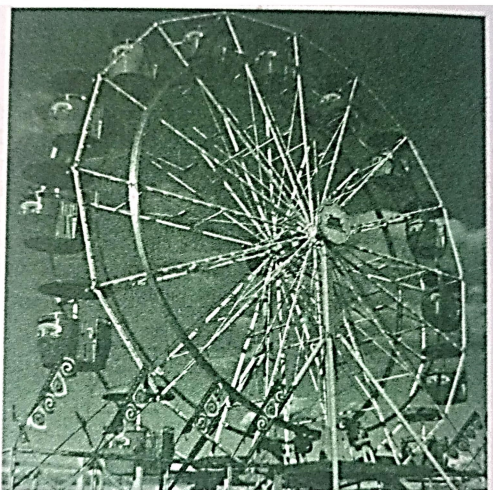


SECTION-E

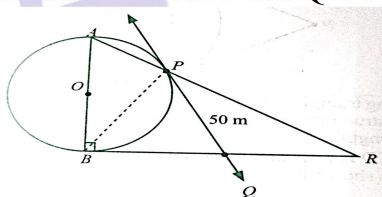
Case Based Questions

36. Case Based-I: Ferris wheels are a popular attraction at fairs and amusement parks all over the world. They offer a unique and exciting experience for people of all ages. It is a large amusement ride consisting of a rotating upright wheel with passenger cary attached to the rim. The wheel is rotated by

a motor and gears, and the cars rotate with the wheel. The cars are typically enclosed, and they have seats for riders.



Ravi with his four friends went to a fair and there they decided to enjoy the ride of the Ferris wheel. Due to the fear of the height, Ravi and one of his friends decided not to join them. They came out of the crowd and started observing their friends who were enjoying the ride. Ravi forms the figure as given below where the distance between P and Q is 50 m.



- (i) Find the $\angle APB$.
- (ii) Find the distance between B and Q.

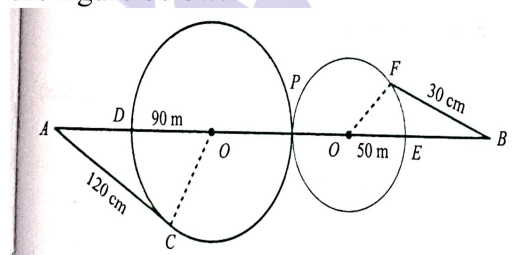
OR

Find the distance between Q and R.
(iii) If the radius of the Ferris wheel is 10 m, then find the distance between A and R.

37. Case Based-II: The founders of Physics Wallah launched an event 'PW Sports Maniac', a mass health awareness campaign across PW Vidyapeeth and Pathshala. They planned a variety of sports activities to cater to different interests including, cricket, football, badminton, race, etc.



The centre of attraction of this sport event is a race as it was open to all students, regardless of their age or skill level. It was a great way to promote physical fitness and healthy competition among the students. The track for the race is shown in the figure below.



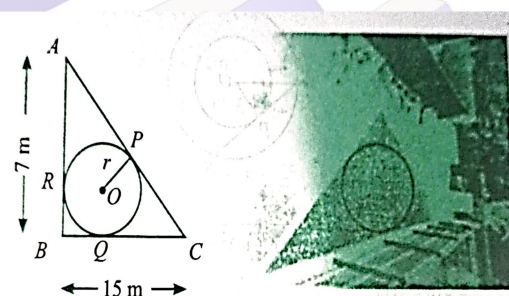
On the basis of the above information, answer the following questions.

- (i) Find the length of the path OA
- (ii) Find the length of the path AD.

OR

Find the length of the path O'B
(iii) Find the length of the line segment AB

38. Case Based-III: A backyard is in the shape of a triangle ABC with right angle at B. $AB = 7$ m and $BC = 15$ m. 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.



Based on the above information, answer the following questions:

- (i) Find the length of AR in terms of x.
- (ii) Write the type of quadrilateral BQOR
- (iii) (a) Find the length PC in terms of x and hence find the value of x.

OR

(b) Find x and hence find the radius r of circle.

