



Octahedral classes, kharadi
2nd floor, yashwant plaza, near bank of India,

Class 10 - Mathematics

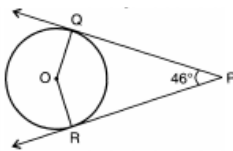
Circles

Maximum Marks: 35

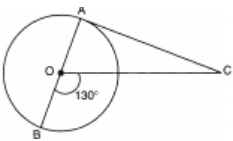
Time Allowed: 1 hour and 30 minutes

Section A

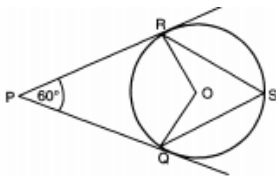
1. How many common tangents can be drawn to two circles touching externally? 1
2. If PQ and PR are two tangents to a circle with centre O. If $\angle QPR = 46^\circ$, find $\angle QOR$ 1



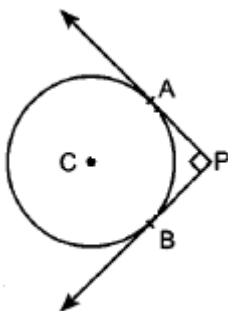
3. In the given figure, AOB is a diameter of the circle with centre O and AC is a tangent to the circle at A. If $\angle BOC = 130^\circ$, then find $\angle ACO$ 1



4. In the given figure, find $\angle QSR$ 1



5. In figure, PA and PB are two tangents drawn from an external point P to a circle with centre C and radius 4 cm. If $PA \perp PB$, find the length of each tangent. 1

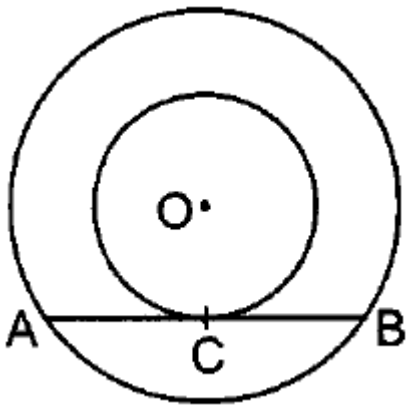


6. A quadrilateral ABCD is drawn to circumscribe a circle (see figure). Prove that $AB + CD = AD + BC$ 1
7. In the adjoining figure, a circle touches the side DF of $\triangle EDF$ at H and touches 1

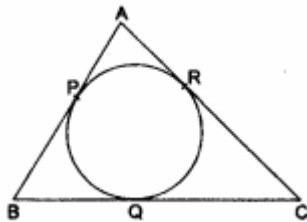
ED and EF produced at K and M respectively. If $EK = 9$ cm, then what is perimeter of $\triangle EDF$?



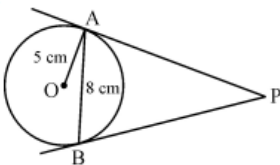
8. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact. Using the above, do the following: In figure, O is the centre of the two concentric circles. AB is a chord of the larger circle touching the smaller circle at C. Prove that $AC = BC$. 1



9. Two concentric circles are of radii 6.5 cm and 2.5 cm. Find the length of the chord of the larger circle which touches the smaller circle. 1
10. A circle is inscribed in $\triangle ABC$ touching AB, BC and AC at P, Q and R respectively. If $AB = 10$ cm, $AR = 7$ cm and $CR = 5$ cm, find the length of BC. 1

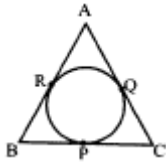


11. In a given figure, AB is a chord of length 8 cm of a circle of radius 5 cm. The tangents to the circle at A and B intersect at P. Find the length of AP. 2

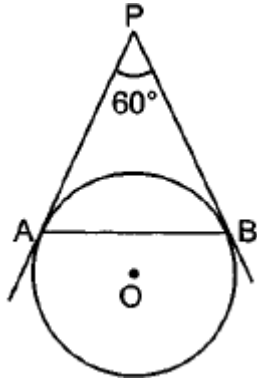


12. ABC is an isosceles triangle in which $AB = AC$, circumscribed about a circle, as shown in the adjoining figure. Prove that the base is bisected at the point of 2

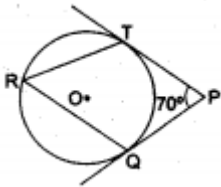
contact.



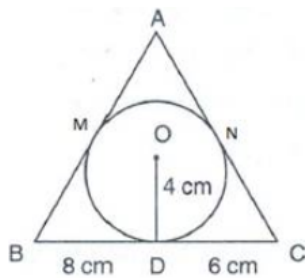
13. In figure, AP and BP are tangents to a circle with centre O, such that $AP = 5$ cm and $\angle APB = 60^\circ$. Find the length of chord AB. 2



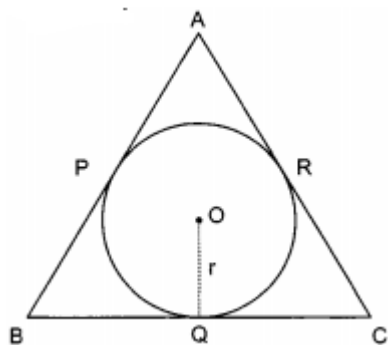
14. In the given figure, O is the centre of a circle. PT and PQ are tangents to the circle from an external point P. If $\angle TPQ = 70^\circ$, find $\angle TRQ$. 2



15. Prove that a tangent to a circle is perpendicular to the radius through the point of contact. 2
16. In figure, a $\triangle ABC$ is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC are of lengths 8 cm and 6 cm respectively. Find the lengths of sides AB and AC, when area of $\triangle ABC$ is 84 cm². 3



17. In figure the sides AB, BC and CA of triangle ABC touch a circle with centre O and radius r at P, Q and R respectively. 3

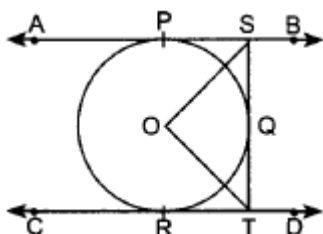


Prove that:

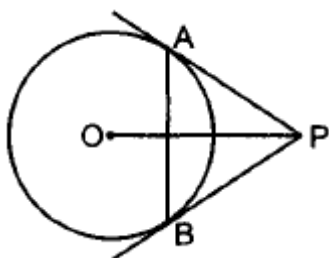
- i. $AB + CQ = AC + BQ$
- ii. $Area(\Delta ABC) = \frac{1}{2}(\text{Perimeter of } \Delta ABC) \times r$

18. In figure AB and CD are two parallel tangents to a circle with centre O. ST is tangent segment between the two parallel tangents touching the circle at Q. 3

Show that $\angle SOT = 90^\circ$



19. In figure, PA and PB are two tangents drawn from an external point P to a circle with centre O. Prove that OP is the right bisector of line segment AB. 3



20. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. 3

Find the length TP.

