



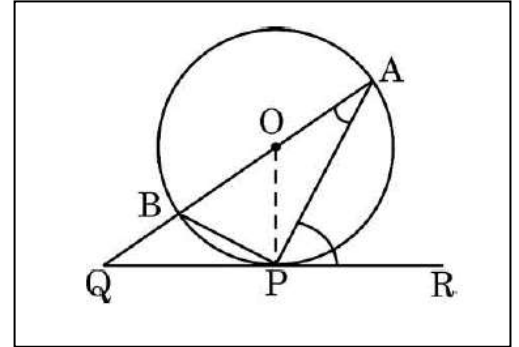
INDIAN SCHOOL AL WADI AL KABIR

Class X, Mathematics

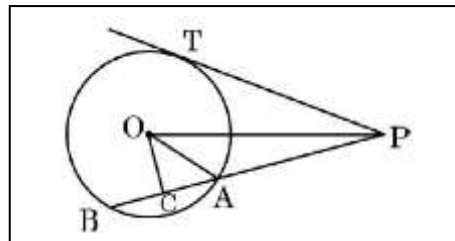
Worksheet-Circles(DTQ)

Questions of 2 marks each

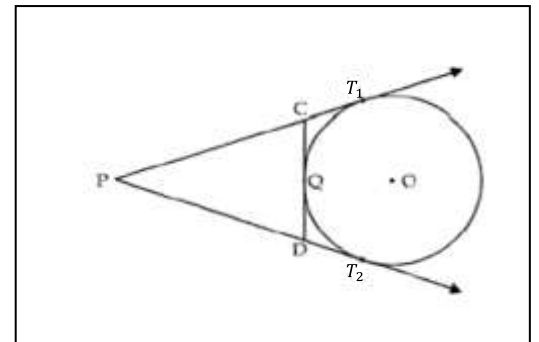
- 1.. In the given figure, O is the centre of the circle and QPR is a tangent to it at P. Prove that $\angle QAP + \angle APR = 90^\circ$.



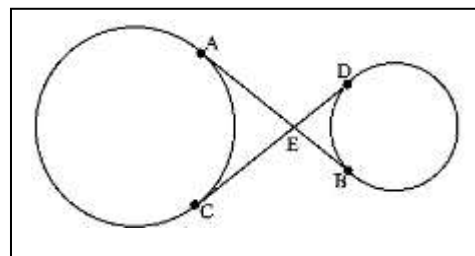
2. In the given figure, PT is a tangent to the circle centered at O. OC is perpendicular to chord AB. Prove that $PA \times PB = PC^2 - AC^2$.



3. In fig., PT_1 and PT_2 are tangents to the circle drawn from an external point P. CD is a third tangent touching circle at Q. If $PT_2 = 12$ cm and $CQ = 2$ cm. What is the length of PC?

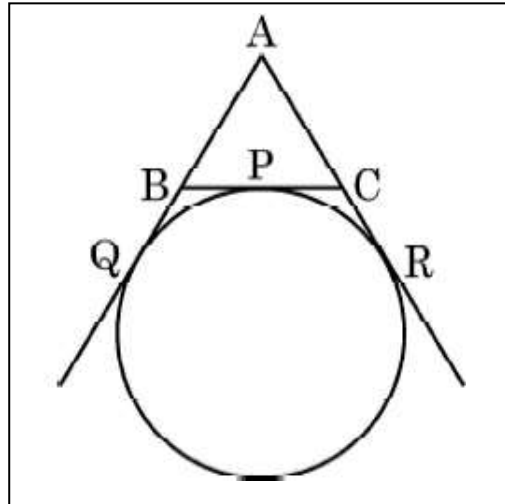


4. In Fig., common tangents AB and CD to two circles intersect at E. Prove that $AB = CD$.

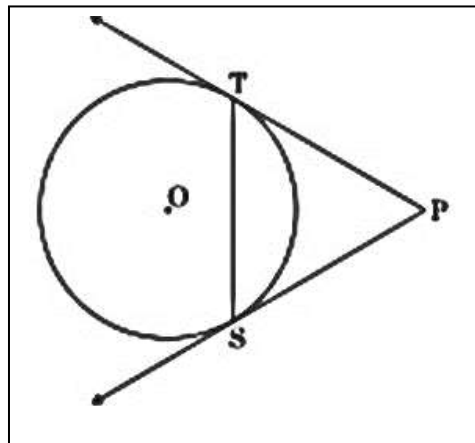


Questions of 3 marks each

5. A circle touches the side BC of a ΔABC at a point P and touches AB and AC when produced at Q and R respectively. Show that $AQ = \frac{1}{2}$ (Perimeter of ΔABC)

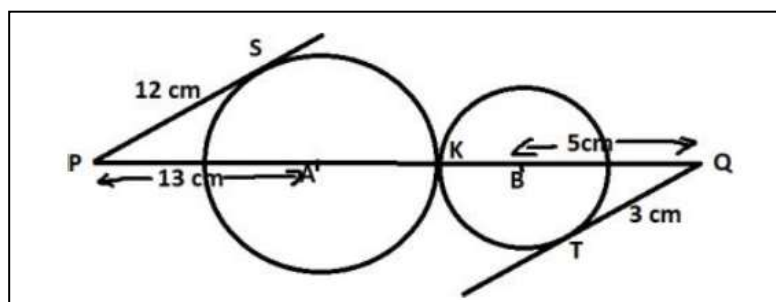


6. In the given figure, PT and PS are tangents to a circle with centre O from a point P, such that $PT = 4$ cm and $\angle TPS = 60^\circ$. Find the length of the chord TS. Also, find the radius of the circle.
(4, $4\sqrt{3}/3$)



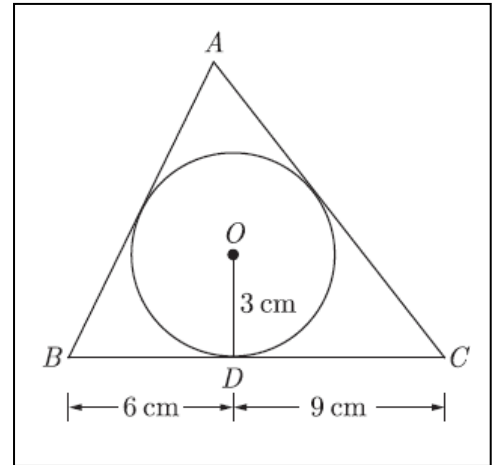
7. Two tangents PQ and PR are drawn from an external point to a circle with centre O. Prove that QORP is a cyclic quadrilateral.

8. In fig, two circles with centres A and B touch each other externally at K. find the length of segment PQ. (Given $PA=13$ cm, $BQ=5$ cm, $PS=12$ cm and $QT=3$ cm)

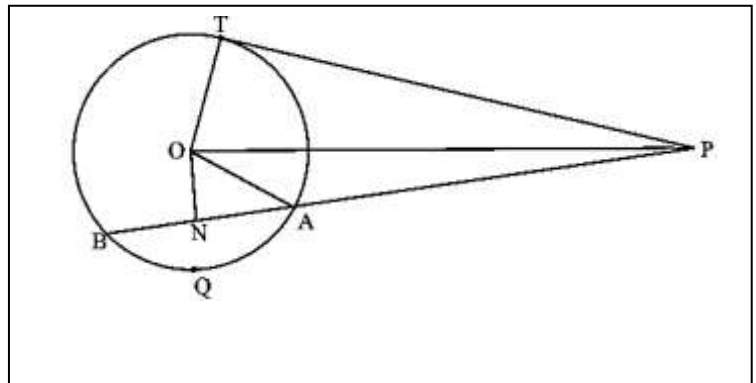


Question of 5 marks

9. In figure, a triangle ABC is drawn to circumscribe a circle of radius 3 cm, such that the segments BD and DC are respectively of lengths 6 cm and 9 cm. If the area of ΔABC is 54 cm^2 , then find the lengths of sides AB and AC .



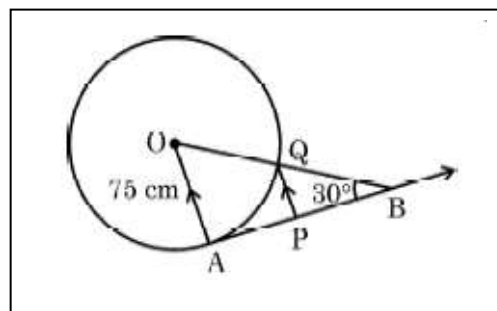
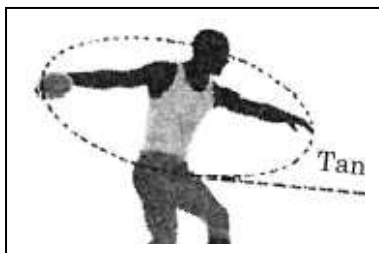
10. In Fig., from an external point P , a tangent PT and a line segment PAB is drawn to a circle with centre O . ON is perpendicular on the chord AB . Prove that :
- (i) $PA \cdot PB = PN^2 - AN^2$
 - (ii) $PN^2 - AN^2 = OP^2 - OT^2$
 - (iii) $PA \cdot PB = PT^2$



SECTION E

Case Study Based Question

11. The discus throw is an event in which an athlete attempts to throw a discus. The athlete spins anti-clockwise around one and a half times through a circle, then releases the throw. When released, the discus travels along tangent to the circular spin orbit.

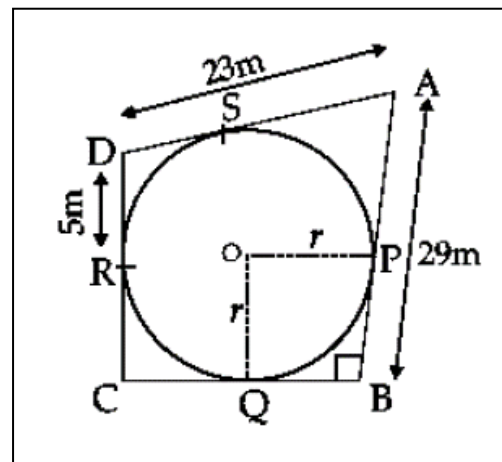


In the given figure, AB is one such tangent to a circle of radius 75 cm. Point O is the centre of the circle and $\angle ABO = 30^\circ$. PQ is parallel to OA.

Based on the above information answer the following questions:

| | | |
|-----|--|----|
| I | Find the length of AB. | 1m |
| II | Find the length of OB. | 1m |
| III | (a) Find the length of AP. OR (b) Find the length of PQ | 2m |

12. ABCD is a playground. Inside the playground a circular track is present such that it touches AB at point P, BC at Q, CD at R and DA at S.



| | | |
|-----|---|----|
| I | If $DR = 5$ m, then DS is equal to: | 1m |
| II | The length of AS is: | 1m |
| III | (a) What is the diameter of given circle? OR (b) What is the value of $\angle BOQ$? | 2m |

Answers

| | | | | | | | | |
|----------------|----|-------------|-----|--|-----|---|----|------------|
| Answers | 1 | Proof | 2 | Proof | 3 | 10 cm | 4 | Proof |
| | 5 | Proof | 6 | $4\text{cm}, \frac{4\sqrt{3}}{3}\text{cm}$ | 7 | Proof | 8 | 27 cm |
| | 9 | 9 cm, 12 cm | 10 | Proof | 11 | $75\sqrt{3}\text{ cm}, 150\text{ cm}, \frac{75\sqrt{3}}{2}\text{ cm}, \frac{75}{2}\text{ cm}$ | | |
| | 11 | I. 5 cm | II. | 18 cm | III | 22 cm | OR | 45° |