INDIAN SCHOOL MUSCAT

SENIOR SECTION
DEPARTMENT OF MATHEMATICS
CLASS X
WORKSHEET NO. 8
CIRCLES

SECTION A: (1 MARK)

1. From a point P, which is at a distance of 13 cm from the centre O of a circle of radius 5 cm, the pair of tangents PQ and PR are drawn to the circle. Find the area of the quadrilateral PQOR {60 cm^2}
.

2. In fig 1, if O is centre of a circle, PQ is a chord and the tangent PR at P makes an angle of 50° with PQ, then find ∠POQ. {100^0}

3. Point P is 26 cm away from the centre O of a circle and the length PT of the tangent drawn from P to the circle is 24 cm. Then find the radius of the circle. {10 cm}

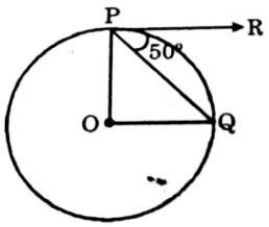

Fig.1

SECTION B :(2 MARKS)

4. Two concentric circles of radii a and b , where a > b are given. Find the length of chord of the larger circle which touches the smaller circle. {$2(a^2–b^2)$}

5. If d_1, d_2 ($d_2>d_1$) be diameters of two concentric circles, c be the length of a chord of the circle which is tangent to the other circle, prove that $d_2^2 = c^2 + d_1^2$.

6. If two tangents inclined at an angle 60^0 are drawn to a circle of radius 3 cm, find the length of each tangent. {$3\sqrt{3}$ cm}

7. PA and PB are two tangents drawn from an external point P to a circle with centre O. If OP is equal to diameter of the circle, prove that ΔABP is equilateral.

8. In the given figure (fig.2) , BOA is a diameter of a circle and the tangent at a point P meets BA produced at T. If $\angle PBO$ = 30°, what is the measure of $\angle PTA$? {30^0}

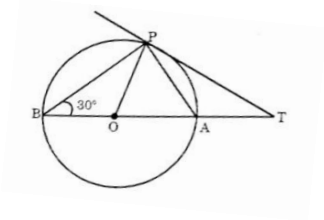

Fig.2

SECTION C: (3 MARKS)

9. If angle between two tangents PT and QT drawn from a point T to a circle of radius r and centre O is 60°, then prove that PT = $\sqrt{3}$ r.

10. In figure 3, a triangle ABC is drawn to circumscribe a circle of radius 10 cm such that the segments BP and PC into which BC is divided by the point of contact P, are of lengths 15 cm and 20 cm respectively. If the area of ΔABC is 525 cm^2, then find the lengths of sides AB and AC. {17.5 cm}

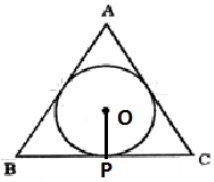

Fig.3

11. In fig.4, AB is diameter of circle with centre O. If AB = 5 cm and AT = 12 cm, find CT. $\{\frac{144}{13}$ cm$\}$

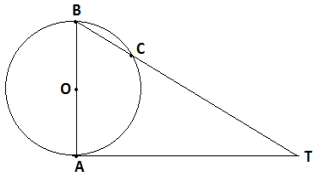

Fig.4

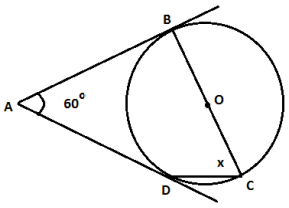

Fig.5

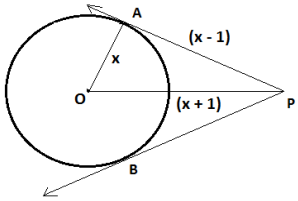

Fig.6

12. In fig.5, find the value of x. $\{60^0\}$

13. In fig.6, find x, if PA and PB are tangents from P. {4 cm}

SECTION D: (4 MARKS)

14. In fig.7, a tangent PT and a line segment PBA is drawn to a circle with centre O. If OL $\perp$ AB, prove that PA x PB = PT^2.

15. In fig.8, QR is tangent at Q. PR∥AQ, where AQ is a chord through A and P is a centre, the end point of the diameter AB. Prove that BR is tangent at B.

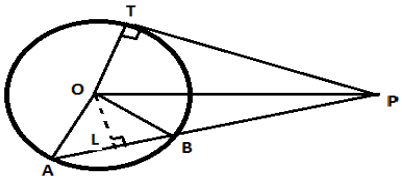

Fig.7

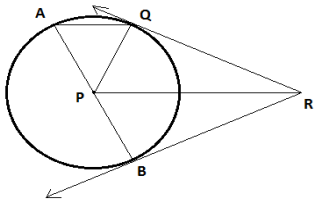

Fig. 8

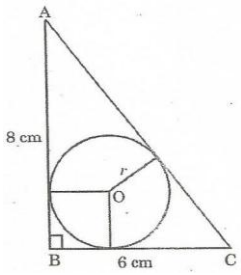

Fig.9

16. In fig .9, ABC is a right triangle in which $\angle B = 90°$. A circle is inscribed in the triangle. If AB = 8 cm and BC = 6 cm, find the radius r of the circle. {2 cm}

17. In a quadrilateral ABCD, $\angle D = 90^o$ and a circle is inscribed within it , which touches the sides AB, BC, CD and DA at P,Q,R and S respectively. If BC = 40 cm, BP = 29 cm and DC = 24 cm, find the radius of the circle. If AD = 20 cm, then find the length of AB. {36 cm}

18. Two concentric circles with centre O have radii 5 cm and 3 cm. From an external point P, tangents PA (to bigger circle) and PB (to the smaller circle) are drawn. If AP is 12 cm, find the length of BP. $\{4\sqrt{10}$ cm$\}$

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