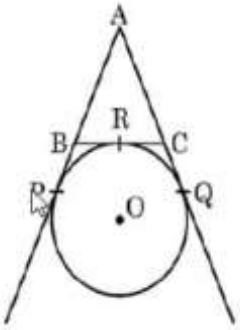
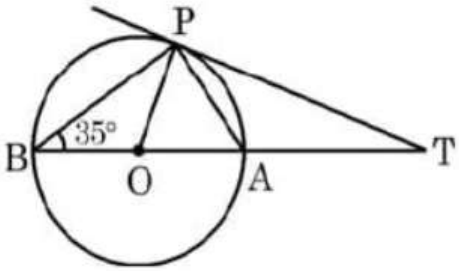
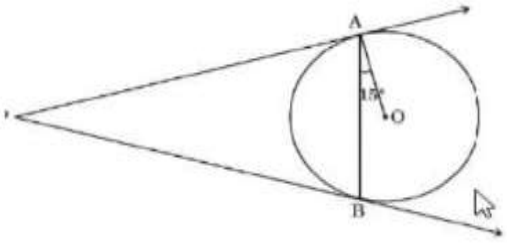
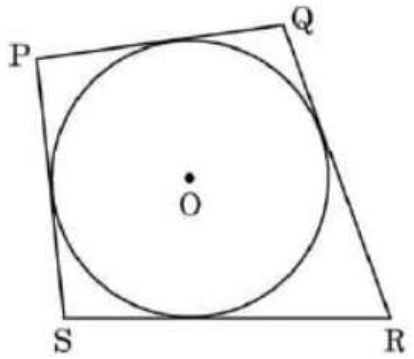
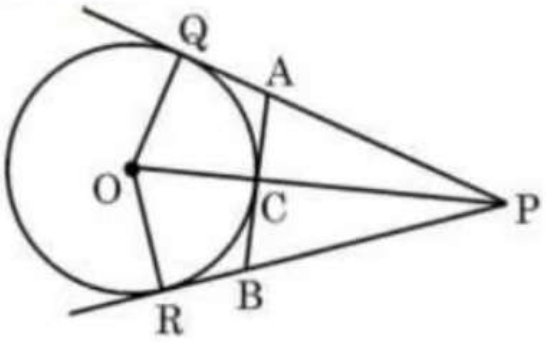
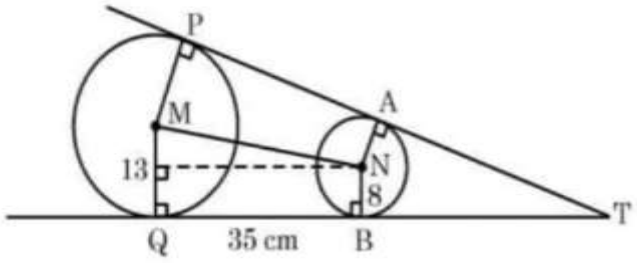
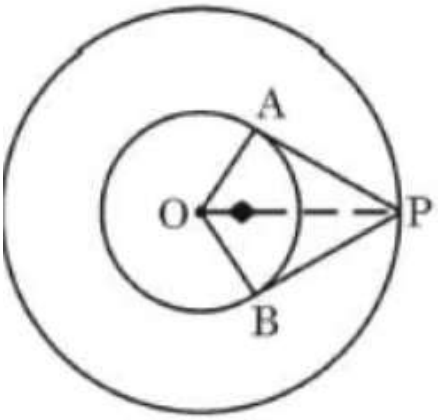
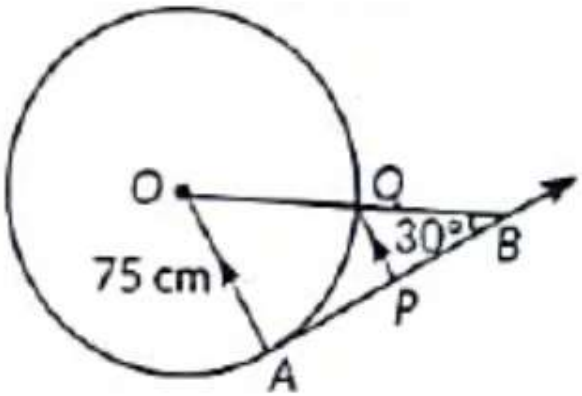
Department of Mathematics	**INDIAN SCHOOL AL WADI AL KABIR** **Class X**, Mathematics **Circles WORKSHEET**

	Short Answer Questions
Q.1.	Two concentric circles are of radii **6 cm** and **10 cm**. Find the length of the chord of the larger circle which touches the smaller circle.
Q.2.	In the given figure, AP, AQ and BC are tangents to the circle with centre O. If AB = 6 cm, AC = 7 cm and BC $= 5$ cm, then what is the length of AP? 
Q.3.	In the given figure, TP is tangent to a circle with centre O. Diameter BA when produced meets the tangent at **T**. If $\angle ABP = 35°$, then find the measure of $\angle PTA$. 
Q.4.	Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.
Q.5.	Two tangents PA and PB are drawn from an external point P to a circle with centre O as shown in the given figure. If $\angle OAB = 15°$, find the measures of each angle of <APB. P 

	Long Answer Questions
Q.6.	In the given figure, quadrilateral PQRS circumscribes the circle with centre O. Prove that the opposite sides of the quadrilateral PQRS subtend supplementary angles at the centre O. 
Q.7.	PQ and PR are two tangents to a circle with centre O and radius 5 cm. AB is another tangent to the circle at C which lies on OP. If $OP = 13$ cm, then find the length AB and PA. 
Q.8.	In the given figure, TP and TQ are tangents to a circle with centre M , touching another circle with centre N at A and B respectively. It is given that $MQ = 13$ cm, $NB = 8$ cm, $BQ = 35$ cm and $TP = 91$ cm. (i) Name the quadrilateral MQBN. (ii) Is MN parallel to PA? Justify your answer. (iii)Find length TB. (iv)Find length **MN**. 

Q.9.	In a circular museum hall of radius 14 m, some statues are displayed. Statues are kept inside the inner concentric circle of radius 7 m. One such statue lying in sector OAB is fenced along line segments OA, AP, PB and BO, where P is a point on the outer circle. AP and PB are tangents to the inner circle at **A** and **B** respectively. Based on above information, answer the following questions:  (i) Find **m∠AOP**. (1 Mark) (ii) Prove that $\triangle OAP \cong \triangle OBP$. (1 Mark) (iii)(a) Find the length of fencing required to protect the statue. (Take $\sqrt{3} = 1.73$) (2 Marks) OR (b) Find area of quadrilateral OAPB. (Take $\sqrt{3} = 1.73$) (2 Marks)	
Q.10.	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 the 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 $\angle ABO = 30°$. PQ is parallel to OA. Based on the above information i. Find the length of AB. (1 Mark) ii. Find the length of OB. (1 Mark) iii. Find the length of AP. (2 Mark) OR iv. Find the value of PQ. (2 Mark)	

ANSWERS

Q.1. $AM = \sqrt{OA^2 - OM^2} = \sqrt{100 - 36} = \sqrt{64}$
$\therefore AB = 2 \times AM = 16$ cm

Q.2. $2AP = AB + BC + AC = 18$
$\Rightarrow AP = 9$ cm

Q.3. $\angle BPO = \angle OBP = 35°, \therefore \angle BOP = 110°$
$\angle OPT = 90° \therefore \angle PTA = 20°$

Q.4. Proof

Q.5. $\angle PAB + \angle PBA + \angle APB = 180°$
$\angle APB = 180° - 150° = 30°$

Q.6. Proof

Q.7. OP $= 13$ cm, OQ $= 5$ cm

$\therefore PQ = \sqrt{169 - 25} = 12$ cm

Let AC $=$ x $=$ AQ
PC $= 13 - 5 = 8$ cm and PA $= 12 -$ x
AC $\perp$ OP $\therefore (12 - x)^2 = x^2 + 8^2$

$$\Rightarrow x = \frac{10}{3}$$

$$AB = 2AC = \frac{20}{3} \text{ cm} \approx 6.7 \text{ cm}$$

$$PA = 12 - \frac{10}{3} = \frac{26}{3} \text{ cm} \approx 8.7 \text{ cm}$$

Q.8. (i) BN||QM and QB ł MN. The quadrilateral MQBN is a trapezium.

(ii) No, as $AN \neq PM$

(iii)$TQ = TP = 91$ cm

$$\therefore TB = 91 - 35 = 56 \text{ cm}$$

(iv)$MN^2 = NS^2 + MS^2$

$$= 35^2 + (13 - 8)^2$$
$$= 1225 + 25 = 1250$$
$$\therefore MN = 25\sqrt{2} \text{ cm}$$

Q.9. (i) OA $= 7$ m, OP $= 14$ m.If $\angle AOP = \theta$, then cos $\theta = \frac{7}{14} = \frac{1}{2} \Rightarrow m\angle AOP = 60°$

(ii) In $\triangle OAP$ and $\triangle OBP$:
$\angle A = \angle B = 90°$ (radius $\perp$ to tangent at point of contact)

		OP = OP (common); OA = OB (radii of same circle) $\therefore \triangle OAP \cong \triangle OBP$ (by RHS congruency) (iii)(a) $\sin 60^\circ = \frac{AP}{14} \Rightarrow AP = 7\sqrt{3}$ m or 12.11 m Total fencing required $= 2(OA + AP) = 2(7 + 12.11) = 38.22$ m (b) $\sin 60^\circ = \frac{AP}{14} \Rightarrow AP = 7\sqrt{3}$ m or 12.11 m Area OAPB $= 2 \times \frac{1}{2} \times OA \times AP = 7 \times 12.11 = 84.77$ m^2
	Q.10.	i. $AB = 75\sqrt{3}$ cm ii. OB=150cm iii. AP=$\frac{75\sqrt{3}}{2}$ cm iv. PQ=37.5 cm

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