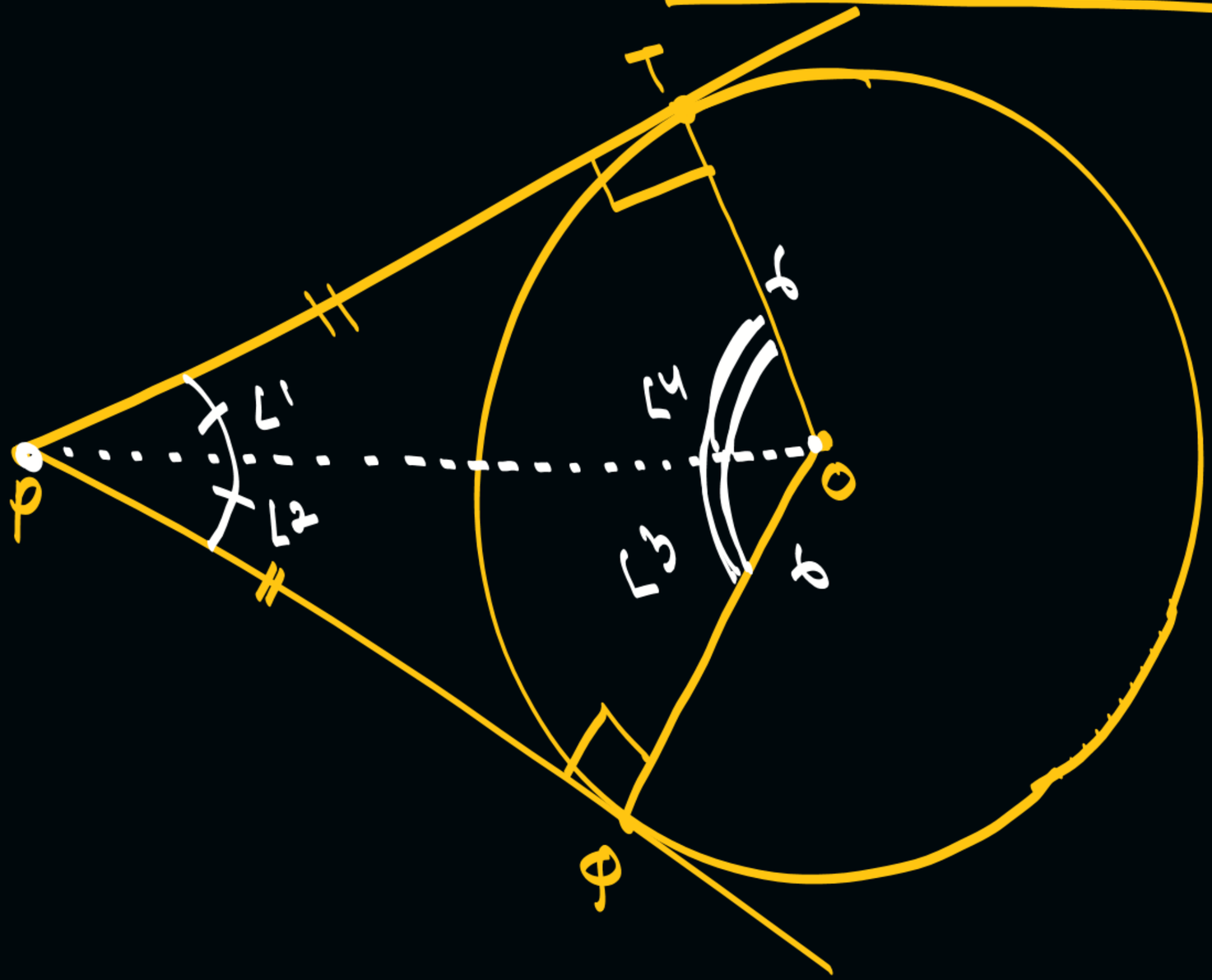
[Aim: 100/100 in Maths]

अभय CLASS 10

CIRCLES

L - 2

#Abhi tak ki kahaani :-

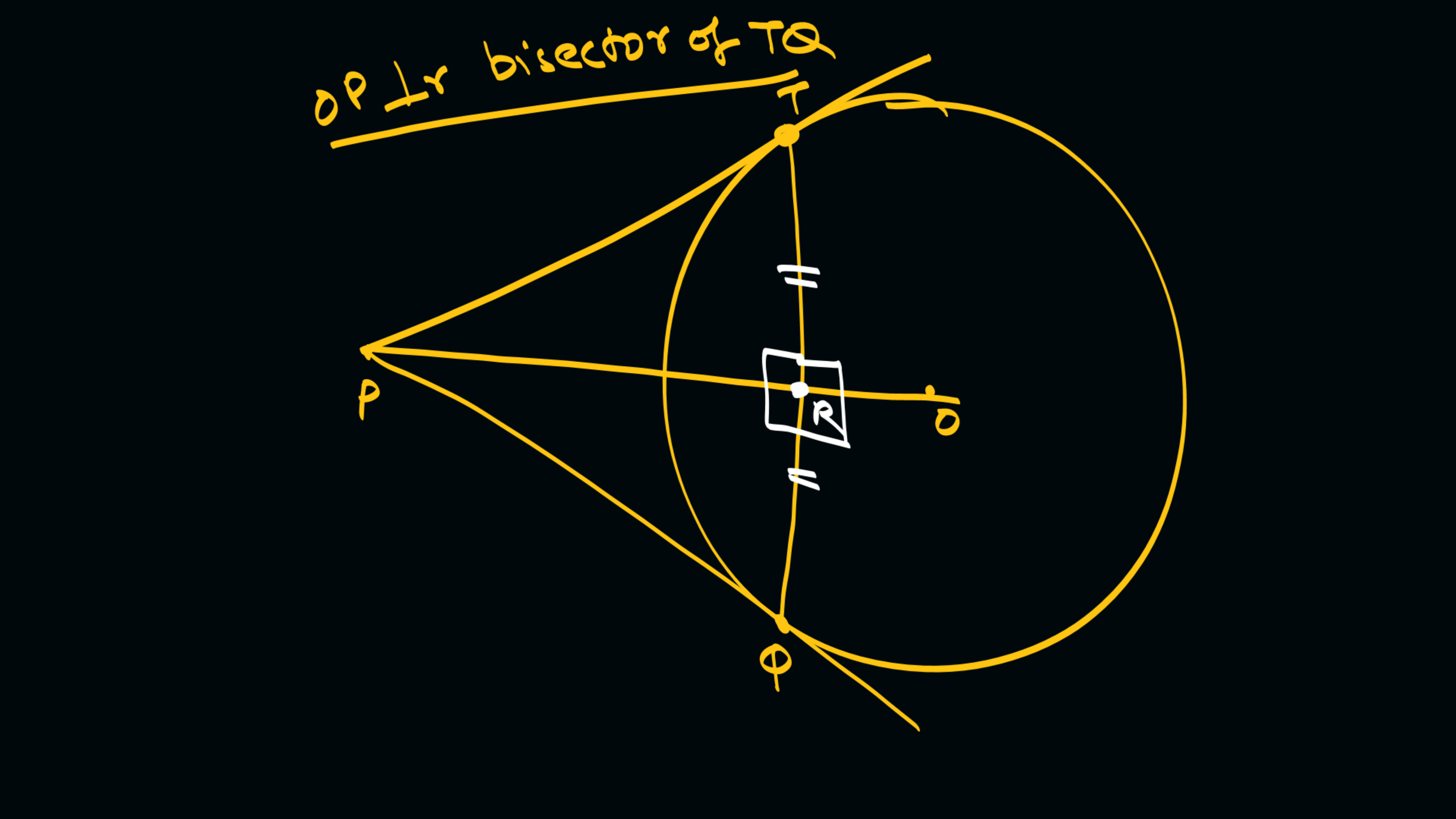


① $PT \perp OT$
$PQ \perp OQ$

② $PQ = PT$

③ $\angle 1 = \angle 2$

④ $\angle 3 = \angle 4$


OP ⊥r bisector of TQ
T
P
R
O
Q

4

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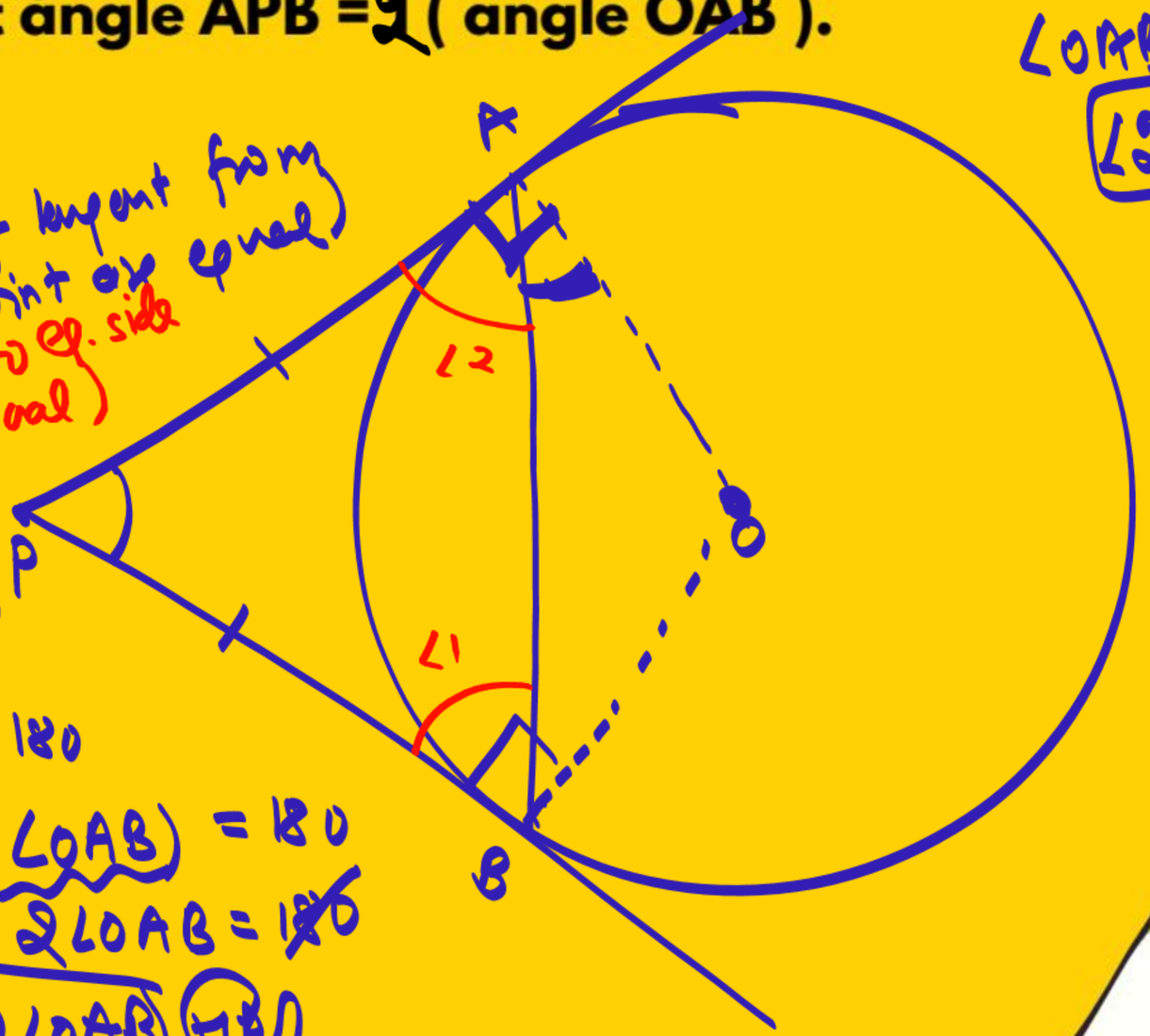
LP : Two tangents PA and PB are drawn to a circle with centre O from an external point P . Prove that angle APB = 2 (angle OAB).

To prove :- $\angle APB = 2\angle OAB$

Proof :- $PA = PB$ (Lengths of tangent from ext. point are equal)

$\angle 1 = \angle 2$ (angles opp to eq. side are equal)



Now, In ΔPAB

ASP → $\angle APB + \angle 1 + \angle 2 = 180$

$\angle APB + 2\angle 2 = 180$

from (I) $\angle APB + 2(90 - \angle OAB) = 180$

$\angle APB + 180 - 2\angle OAB = 180$

$\angle APB = 2\angle OAB$ Hence Proved

$\angle OAB = 90 - \angle 2$

$\angle 2 = 90 - \angle OAB$ (I)

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इस सवाल का Result is V. Imp

 # LP : From an external point P , two tangents PA and PB are drawn to the circle with centre O . Prove that OP is the perpendicular bisector of AB.

To prove :- OP ⊥r bisector of AB

[AR = RB & ∠PRA = 90°]

Proof :- In △PRA & △PRB

PA = PB (Length of tangent from ext pnt)

∠APR = ∠BPR

PR = PR (common)

by SAS ⇒ △PRA ≅ △PRB

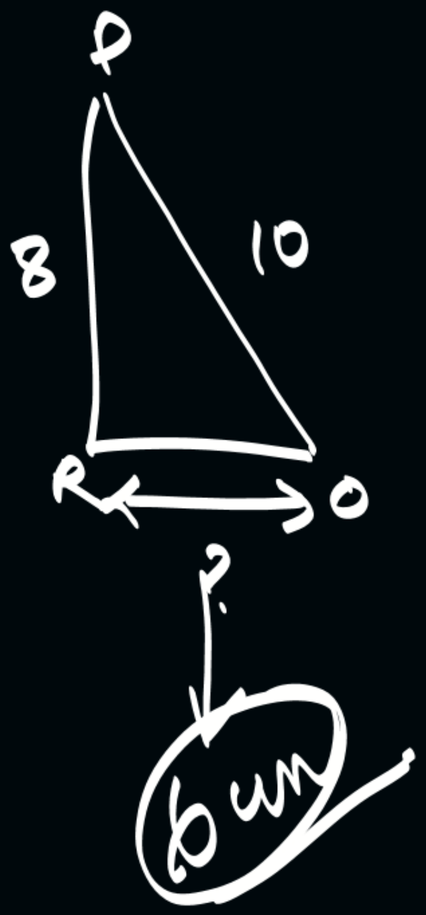
by cpct ⇒ RA = RB (i) Hp

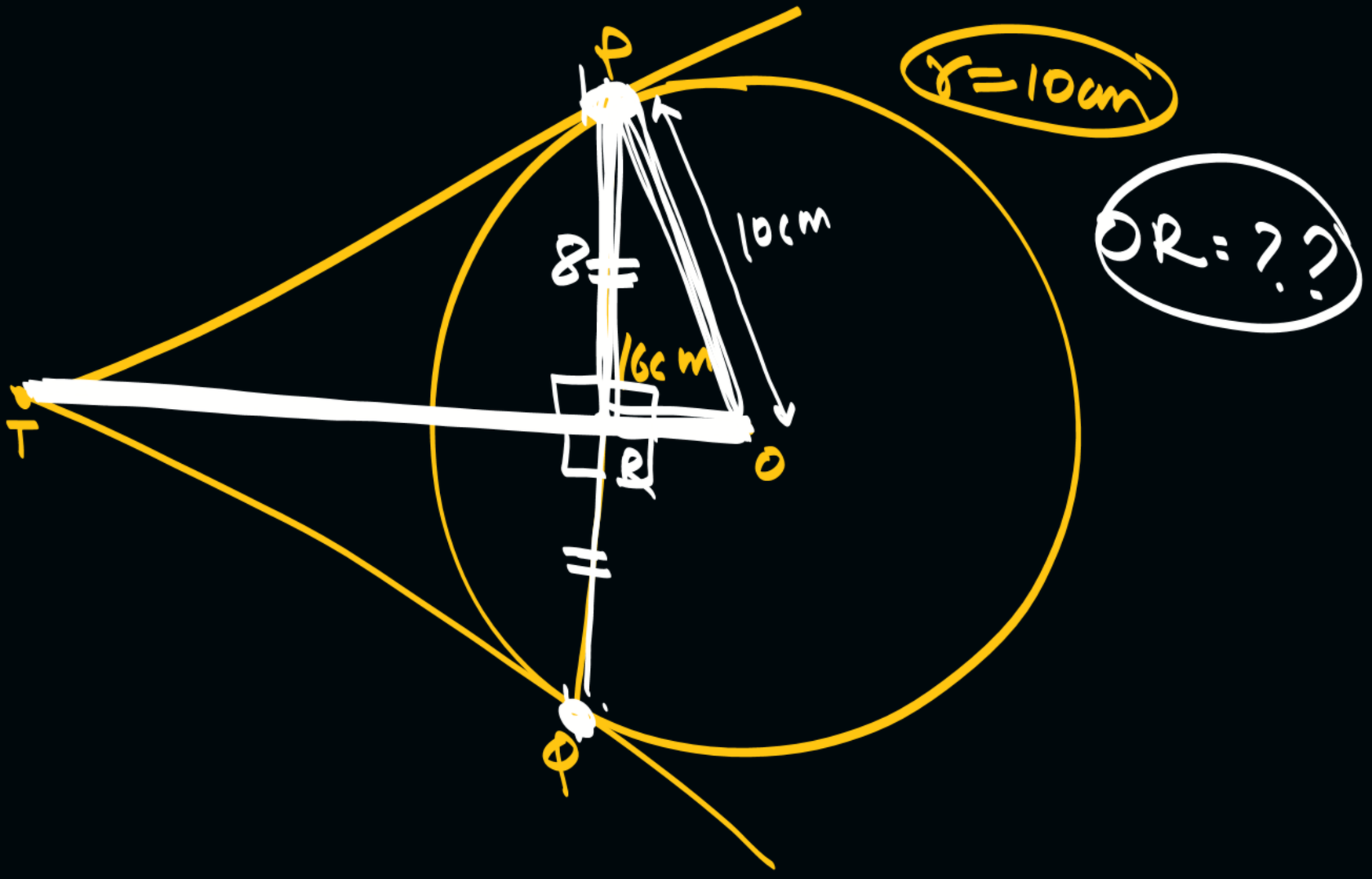
by cpct :- ∠ARP = ∠BRP

∠ARP + ∠BRP = 180° (l.p)

∴ ∠ARP = 180°/2

∠ARP = 90°


P
8
10
R
O
?
6 cm


P
r=10cm
OR: ??
8
10cm
16cm
T
R
O
Q

(4) (+) Right angled Δ → Pytha Trig no

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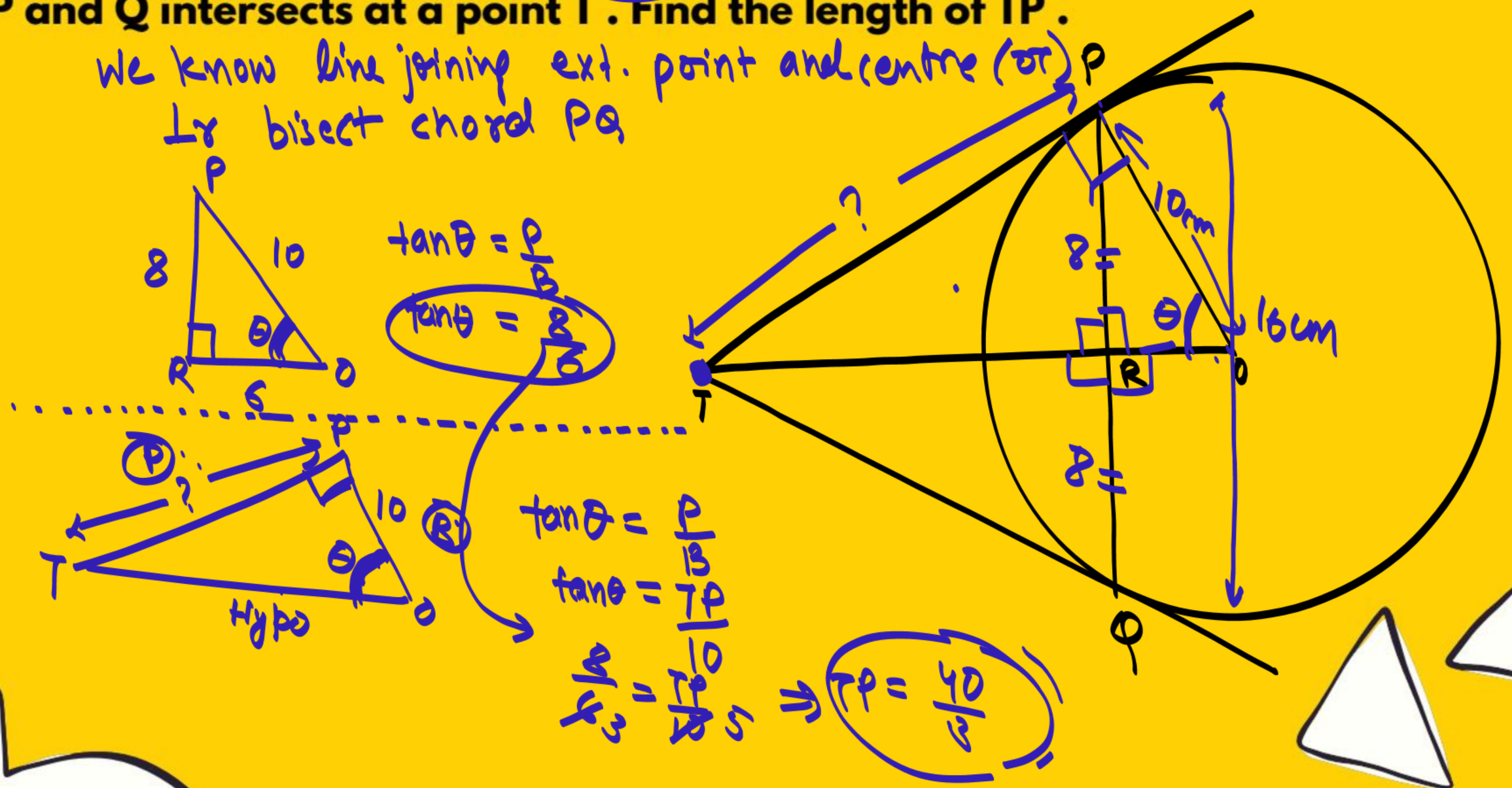
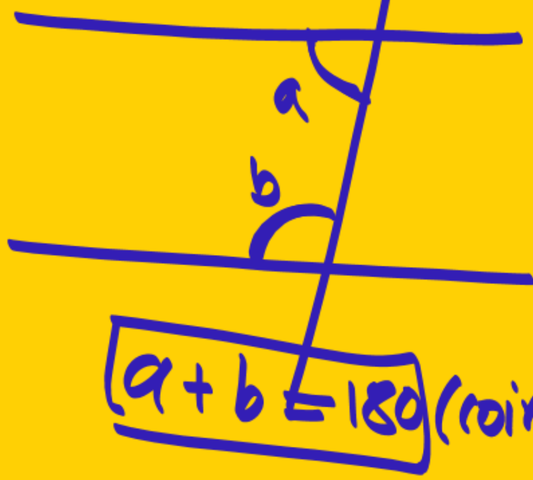
 # LP : PQ is a chord of length 16 cm , of a circle of radius 10 cm . The tangents at P and Q intersects at a point T . Find the length of TP .

We know line joining ext. point and centre (or) ⊥r bisect chord PQ



LP : In figure , l and m are two parallel tangents to a circle with centre O , touching the circle at A and B respectively . Another tangent at C intersects the line l at O and m at E . Prove that ∠ DOE = 90°



ASP → ΔDOE , $\angle DOE + \angle 1 + \angle 2 = 180$

$a + b = 180$ (point)

$2\angle 1 + 2\angle 2 = 180$

$2(\angle 1 + \angle 2) = 180$

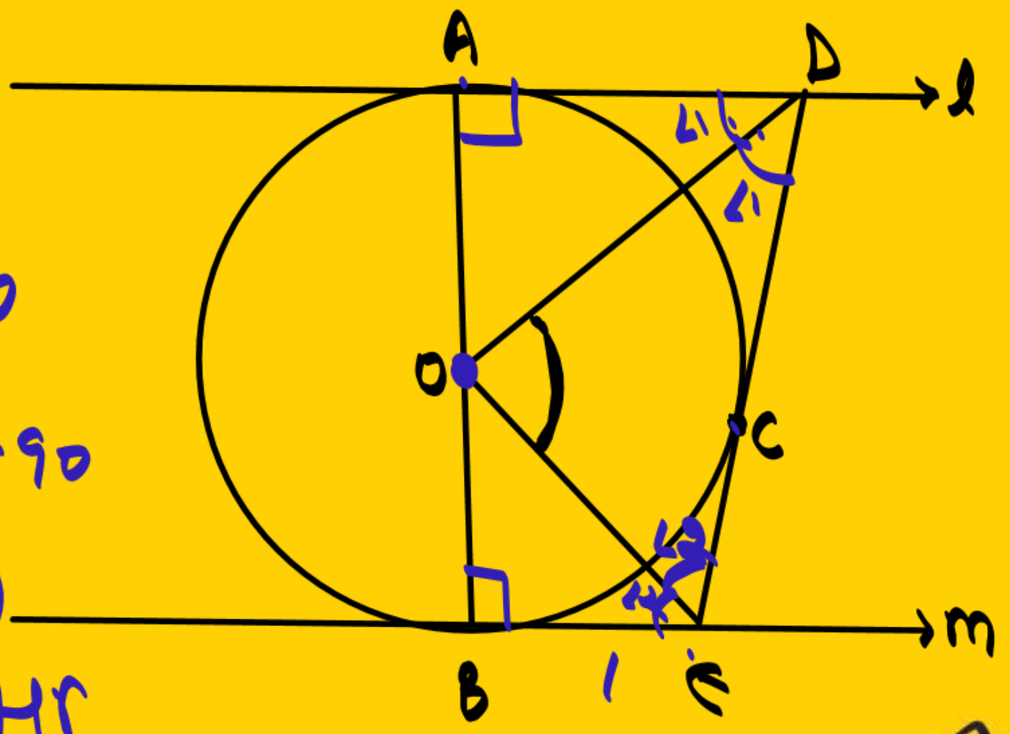
$\angle 1 + \angle 2 = 90$

$\angle DOE + 90 = 180$

$\angle DOE = 180 - 90$

$\angle DOE = 90$

HP



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

$$\text{Area}(\Delta ABC) = 54$$

$$ar(\Delta OAB) + ar(\Delta OBC) + ar(\Delta OAC) = 54$$

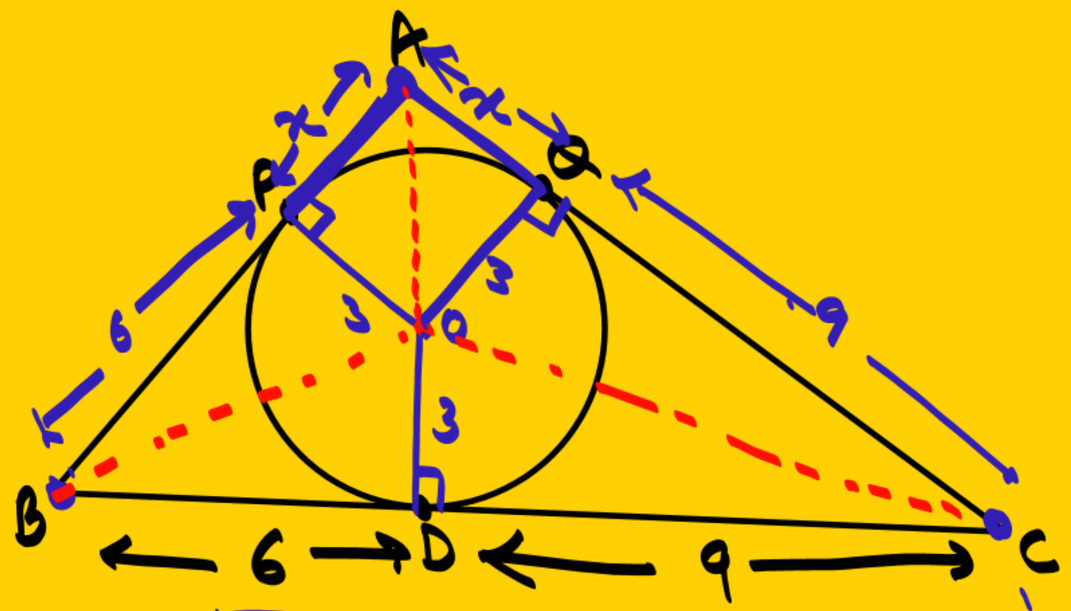
$$\left[\frac{1}{2} \times AB \times 3\right] + \left[\frac{1}{2} \times BC \times 3\right] + \left[\frac{1}{2} \times AC \times 3\right] = 54$$

$$\frac{3}{2}\left[AB + BC + CA\right] = 54$$

$$\frac{3}{2}(6+x+6+9+x+3) = 54$$

$$30 + 2x = 36 \rightarrow 2x = 6$$

$$x = 3$$



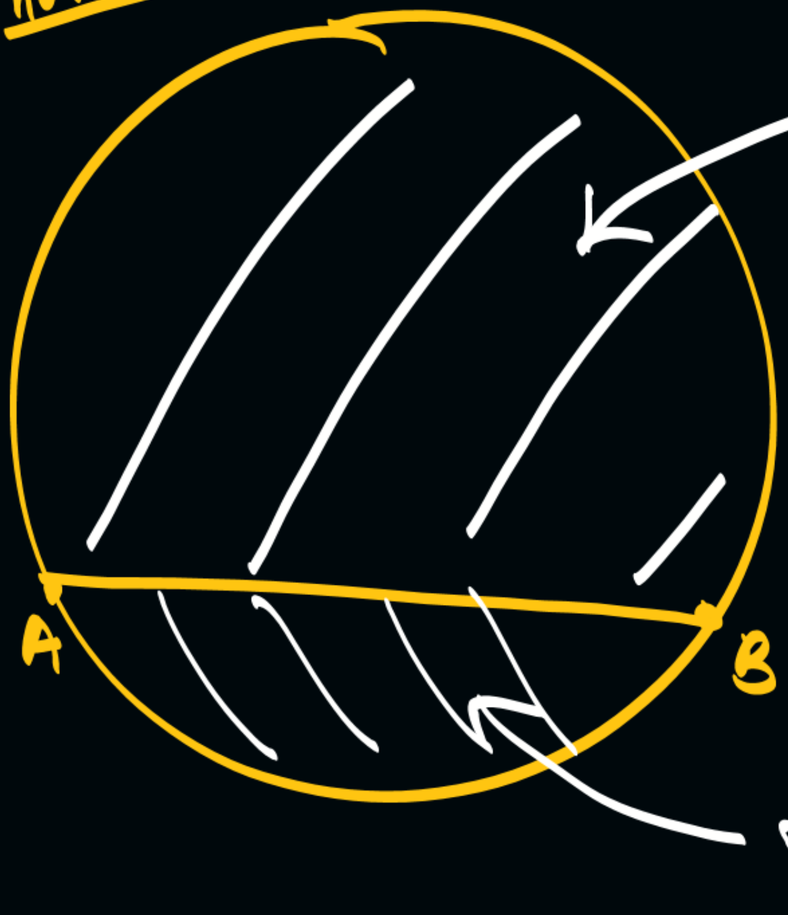
$AB = 6 + x = 6 + 3 = 9$

$AC = 9 + x = 9 + 3 = 12$

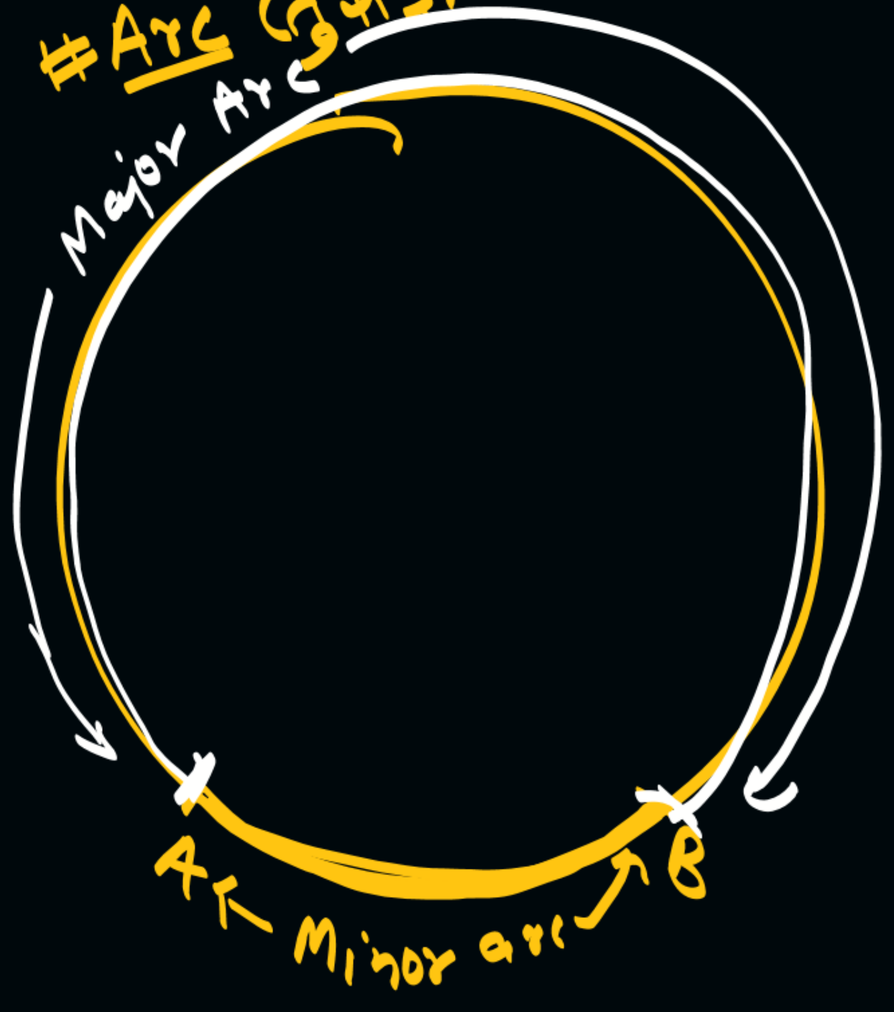
THANK YOU COODIES

AREAS RELATED TO CIRCLE

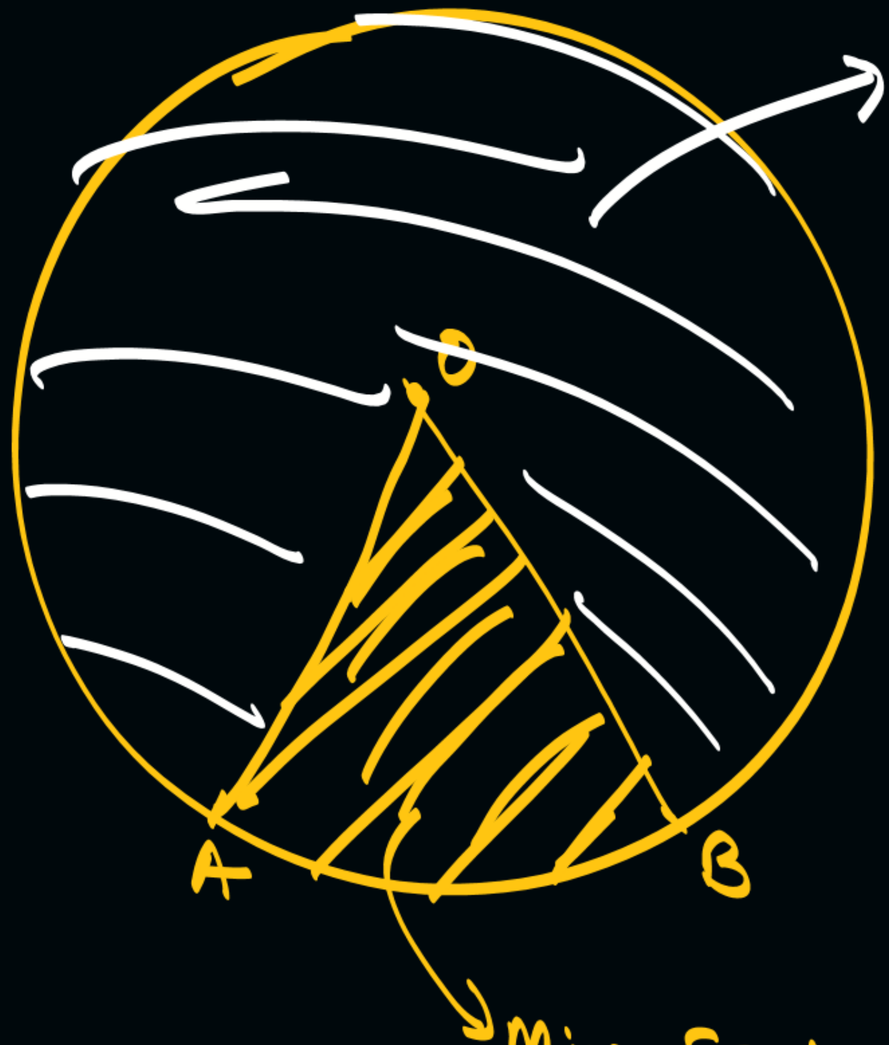
chord



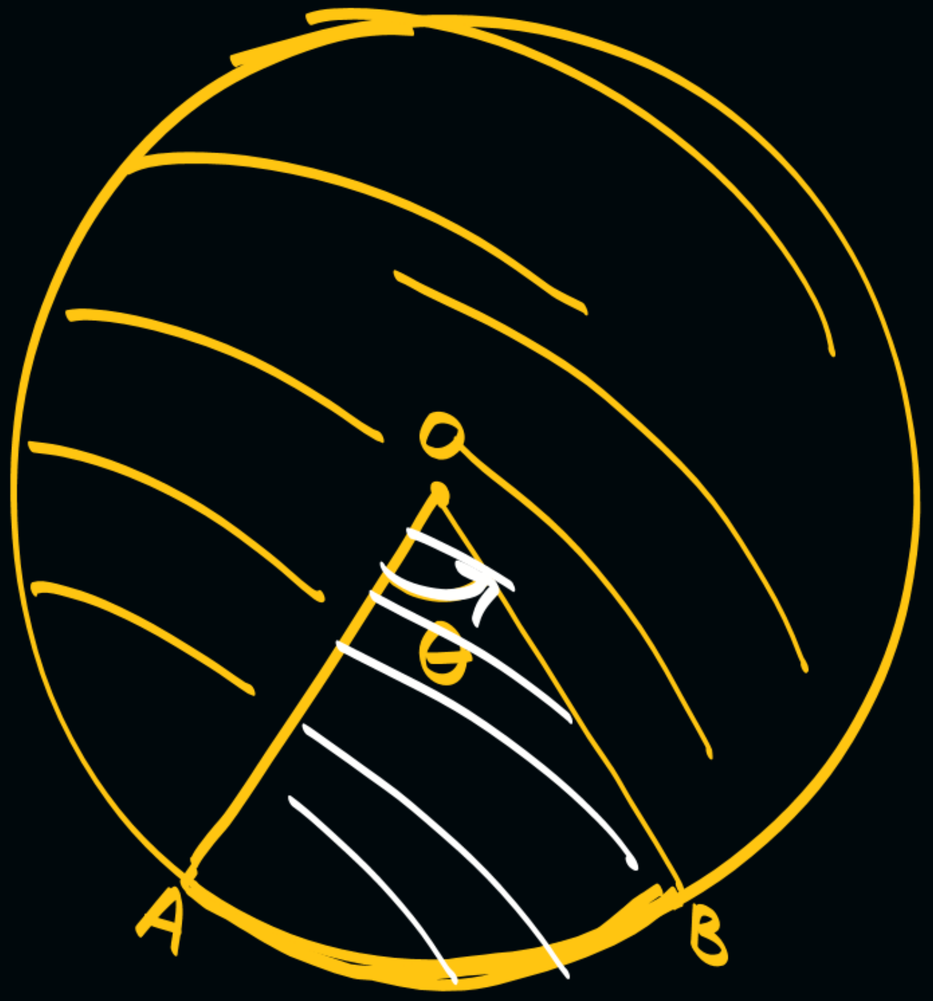
Arc (ज्या)



Sector (Pizza slice)



Area of sector:-



$360^\circ \longrightarrow \pi r^2$

$1^\circ \longrightarrow \frac{\pi r^2}{360}$

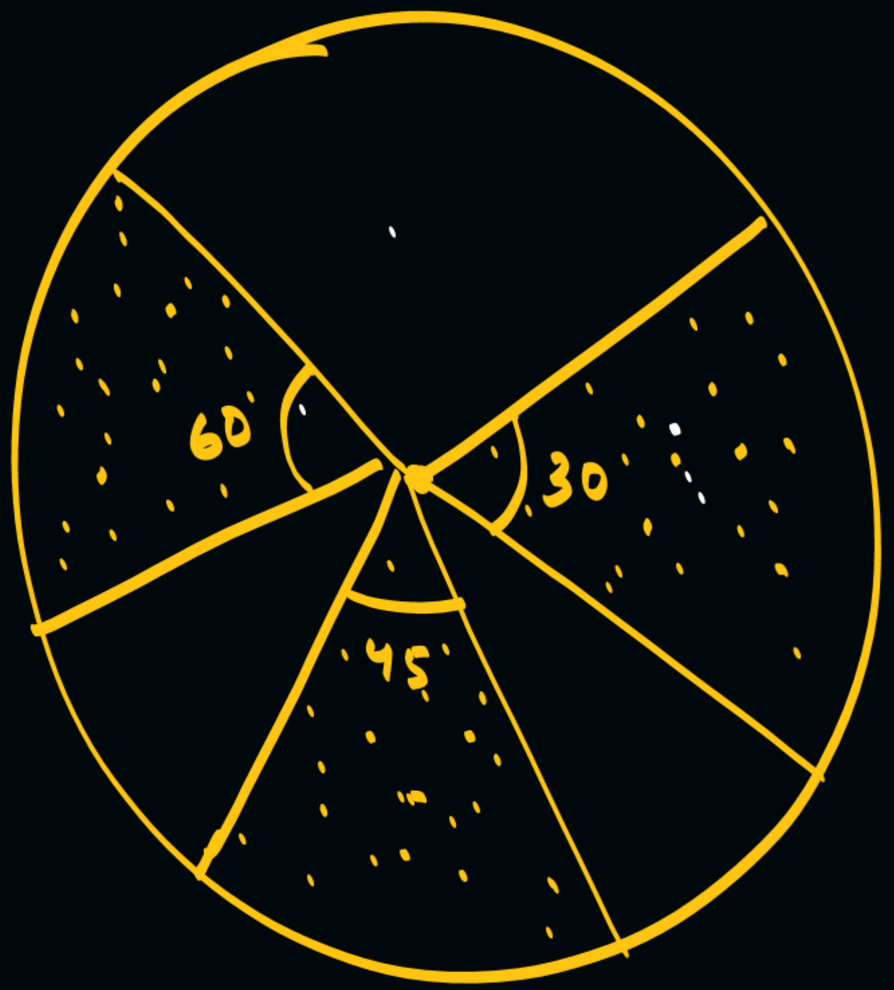
$\theta^\circ \longrightarrow \theta \times \frac{\pi r^2}{360}$

Area of sector (Minor) $= \frac{\theta}{360}\pi r^2$

Ar. of Major sector = Ar. of circle − ar of Minor sector

$= \pi r^2 - \frac{\theta}{360}\pi r^2$

#LP:- ..1



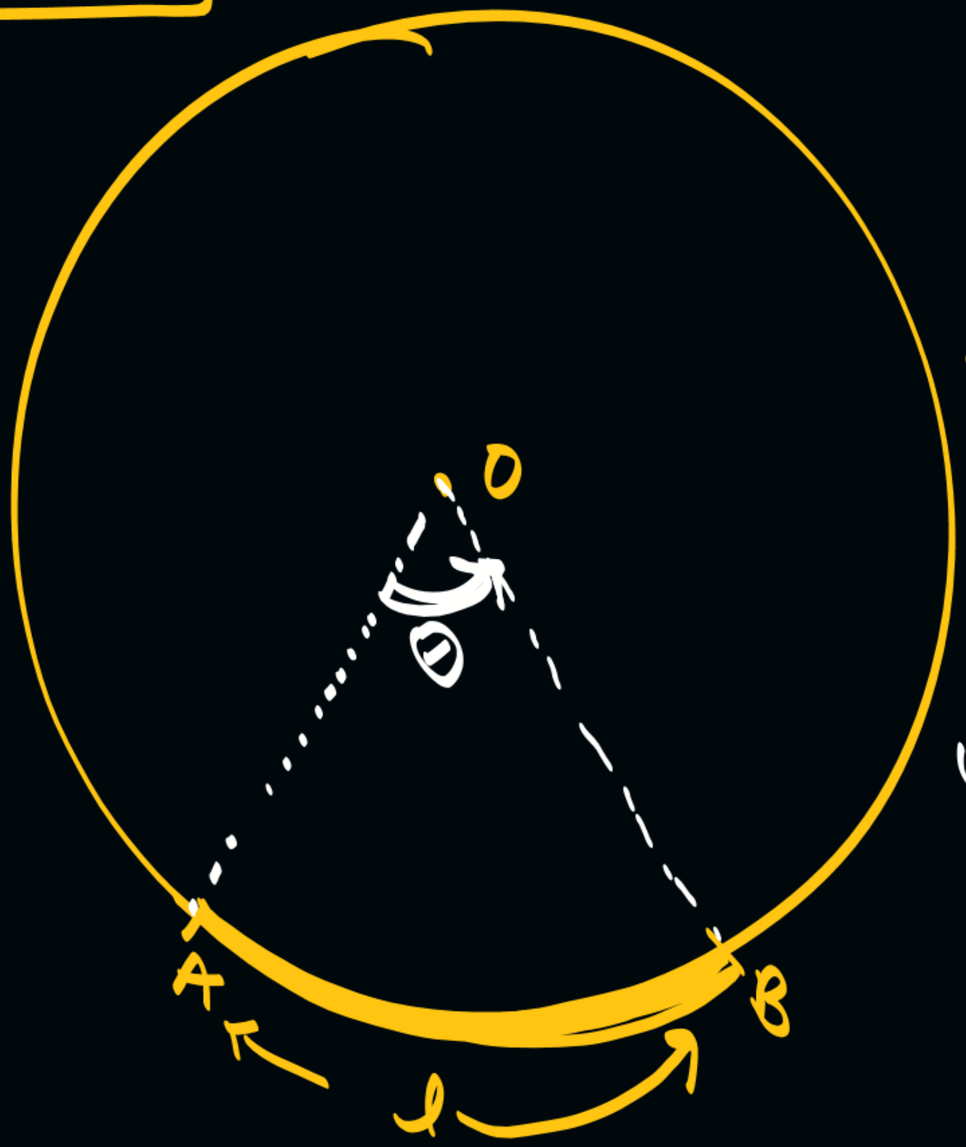
Find the area of Non-shaded part.

$r = 10\,cm$

Ar. of circle − (Ar. of 3 sector)

$\Rightarrow \pi r^2 - \left[\frac{60}{360}\pi r^2 + \frac{45}{360}\pi r^2 + \frac{30}{360}\pi r^2 \right]$

Length of Arc



$360^\circ \longrightarrow 2\pi r$

$1^\circ \longrightarrow \frac{2\pi r}{360}$

$\theta^\circ \longrightarrow \theta \times \frac{2\pi r}{360}$

Length of Arc (Minor) $(l) = \frac{\theta}{360} 2\pi r$

Length of Major Arc $= 2\pi r - l$

$\left[2\pi r - \frac{\theta}{360} 2\pi r\right]$

#LP:- Minute hand of a clock is 10cm. Find the area swept by minute hand from 9:00am to 9:40am.

Ar. of sector = $\frac{\theta}{360} \pi r^2$

Minute hand :-

60 min $\longrightarrow$ 360°

1 min $\longrightarrow \left(\frac{360}{60}\right)^\circ$

40 min $\longrightarrow 40 \times \frac{360}{60}$ (6)

$\theta \Rightarrow 240^\circ$

Seconds hand

'x' second.

$60 \text{ sec} \longrightarrow 360^\circ$

$1 \text{ sec} \longrightarrow \left(\frac{360}{60}\right)^\circ$

$x \text{ sec} \longrightarrow \left(x \times \frac{360}{60}\right)^\circ$

Hour hand

12 hr $\longrightarrow$ 360°

1 hr $\longrightarrow$ $\left(\frac{360}{12}\right)^\circ$

x hr $\longrightarrow$ $\left(x \times \frac{360}{12}\right)^\circ$