



CLASS 10 ACADEMIC PROGRAM-2020

MATH

Lecture : M-22

Chapter 8 : Circle

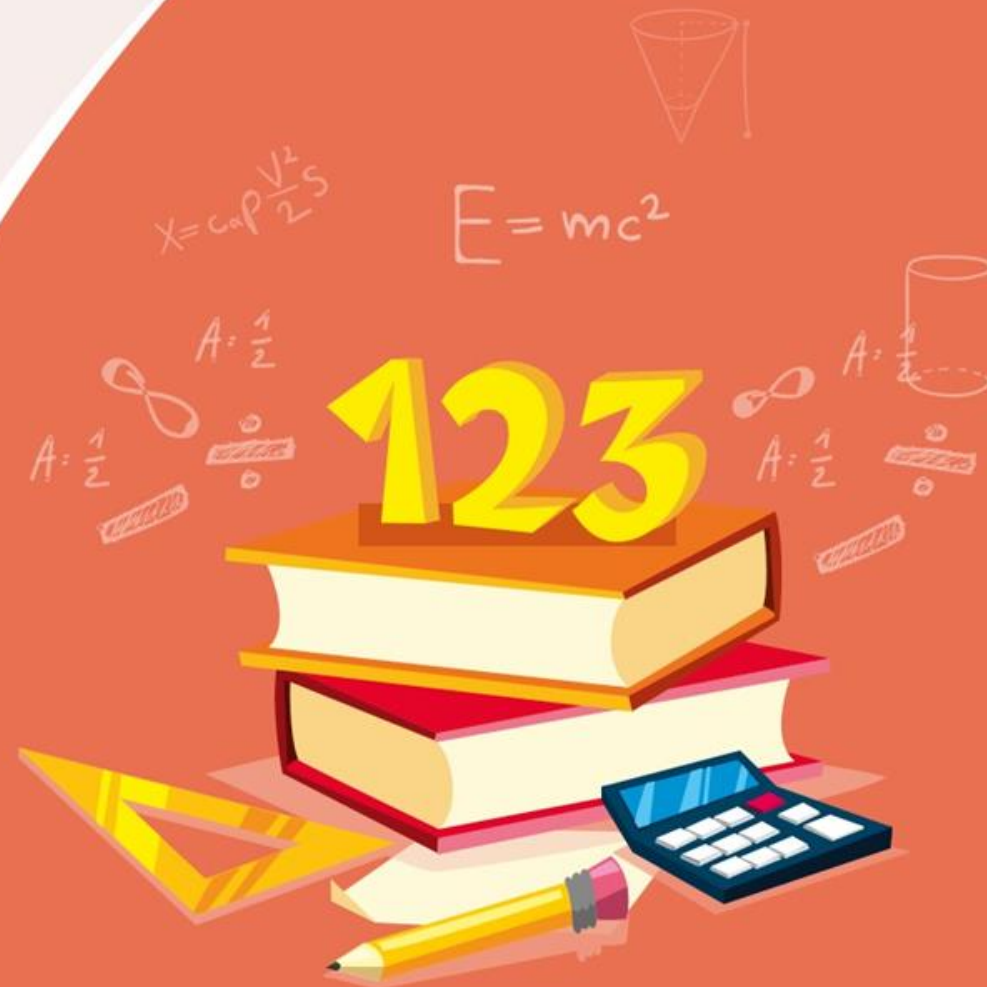


$$x = \sqrt{\frac{a^2}{c} + c} - \frac{b}{2}$$



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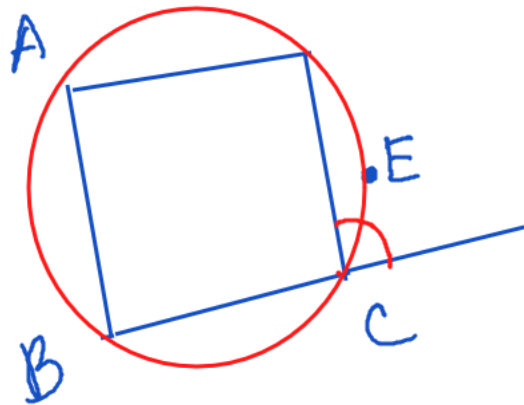


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7. Prove that, the bisector of any angle of a cyclic quadrilateral and the exterior bisector of its opposite angle meet on the circumference of the circle. Have to Prove $\rightarrow$ $ABCE$ is a cyclic quadrilateral.

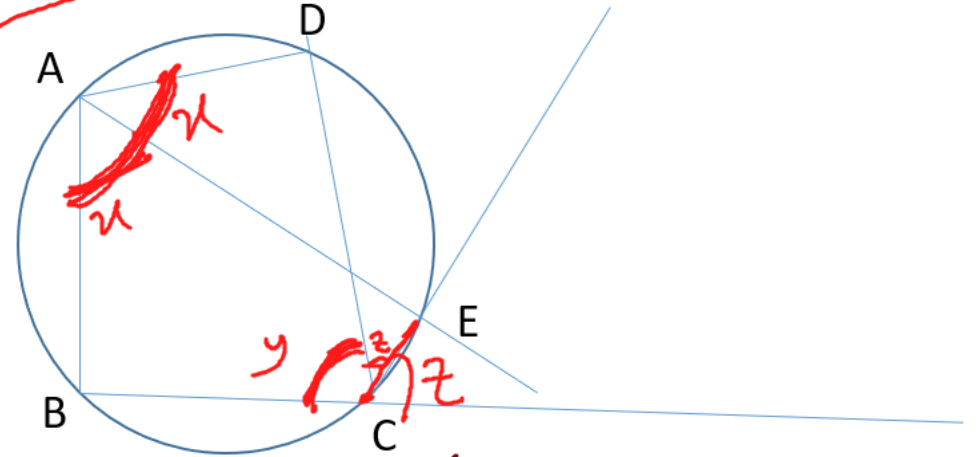
$$\angle BAE + \angle BCE = 180^\circ$$

$$x + y + z = 180^\circ$$



Step 1: $2x = 2z$

$$x = z$$



Step 2: $2x + y = 180^\circ$

Step 3: $x + y + z = x + y + x$
 $= 2x + y$
 $= 180^\circ \rightarrow$ [Proved]



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Math

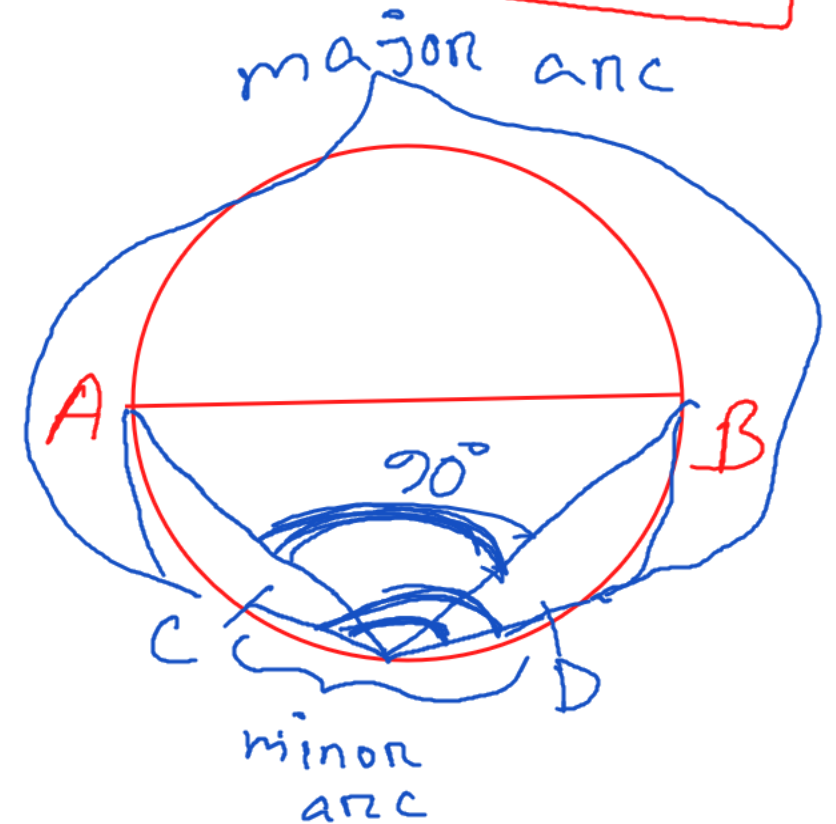
Chapter 8 : Circle

Poll Question 01

standing on
Angle inscribed ⁱⁿ ~~on~~ minor arc is _____ angle.

semicircle

- (a) Acute
- (b) Obtuse
- (c) Reflex
- (d) None



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Poll Question 02

Angle standing on the major arc is _____ angle.

(a) Acute 54%

☒ (b) Obtuse 41%

(c) Reflex

(d) None



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Poll Question 03

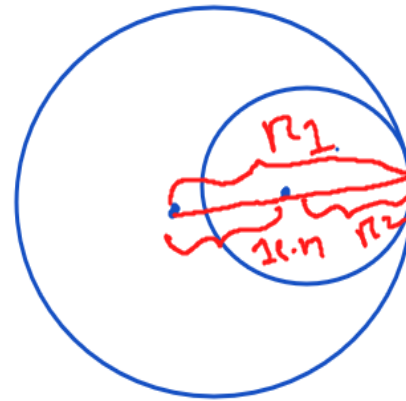
Distance between the centers of two circles touched internally is 1cm. Radius of the bigger circle is 4cm. Then what is the diameter of smaller circle.

(a) 5cm

(b) 3cm

(c) 6cm

(d) 10cm



$$R_1 = 4 \text{ cm}$$

$$R_1 - R_2 = 1$$

$$4 - R_2 = 1$$

$$\boxed{3 = R_2}$$



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Chapter 8 : Circle

Some important terms:

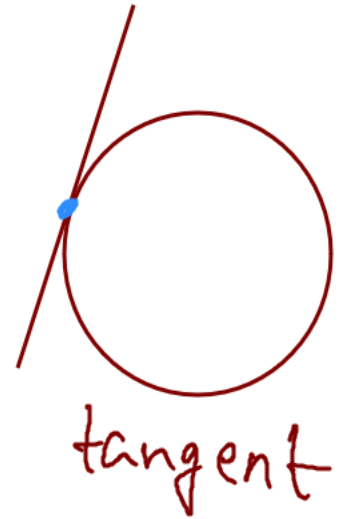
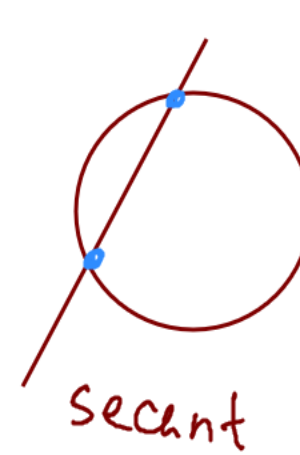
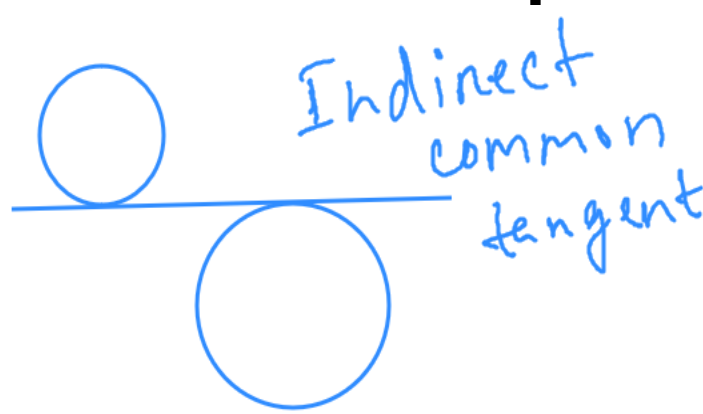
✓ **Secant:**

• **Tangent:**

• **Common tangent:**

✓ **Direct common tangent:**

✓ **Indirect common tangent:**

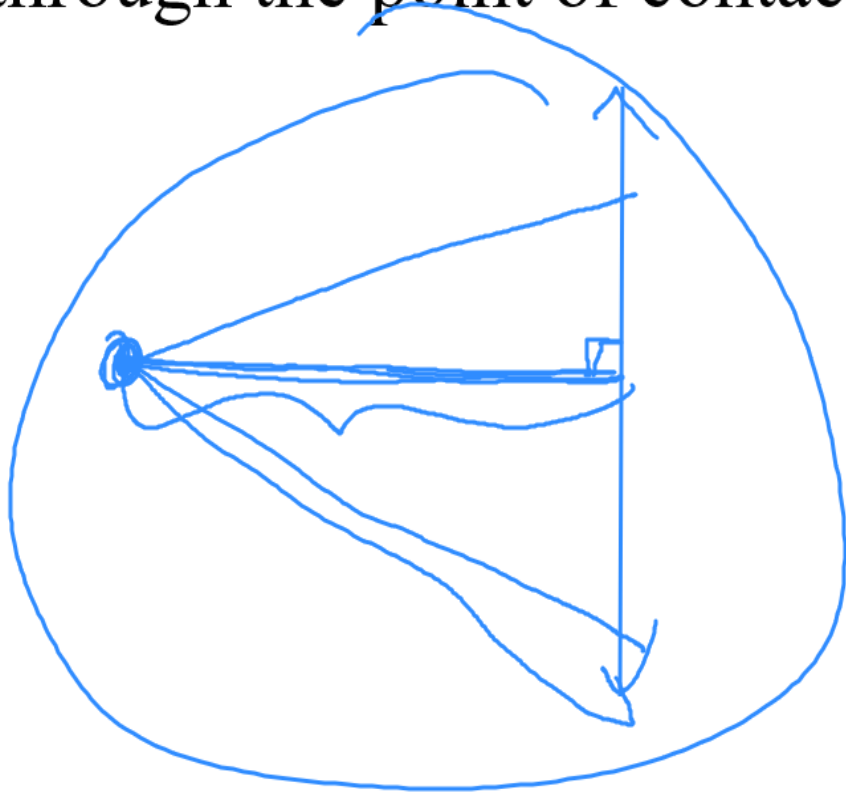


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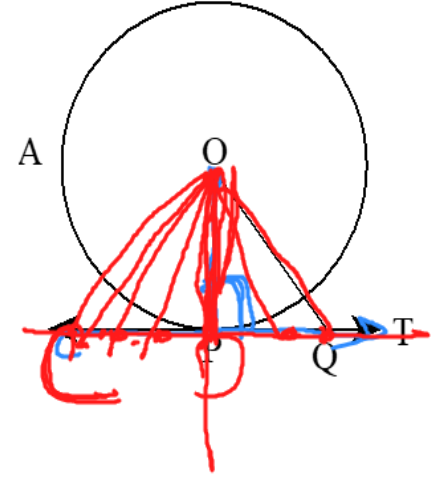
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Theorem 25:

The tangent drawn at any point of a circle is perpendicular to the radius through the point of contact of the tangent.



$OP \perp PT$



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Theorem-26:

If two tangents are drawn to a circle from an external point, the distance from that point to the points of contact are equal.

- ① SAS ^{included}
- ② ASA
- R.H.S.

$$PA = PB$$

$\triangle OPB$ and $\triangle OAP$,

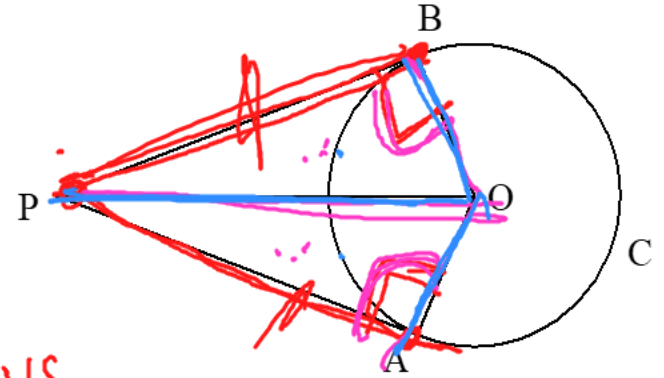
$\because OB = OA = \text{radius}$

$\because OP$ common side

$\because \angle OBP = \angle OAP = 90^\circ$

$\therefore \triangle OPB \cong \triangle OAP ; [$

$$\therefore PA = PB]$$



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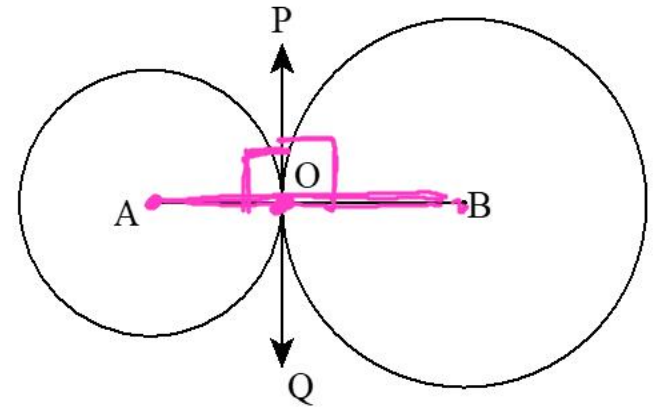
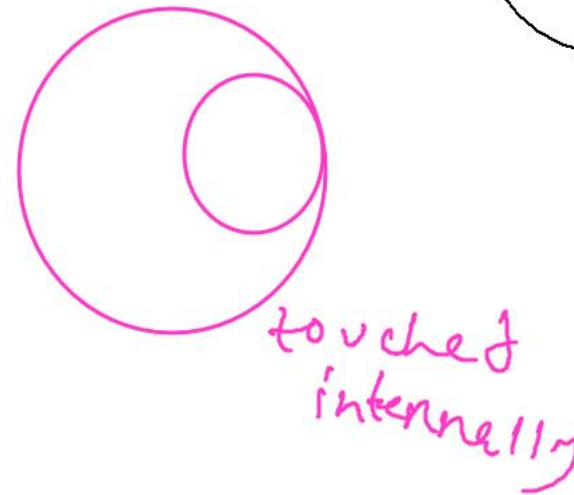
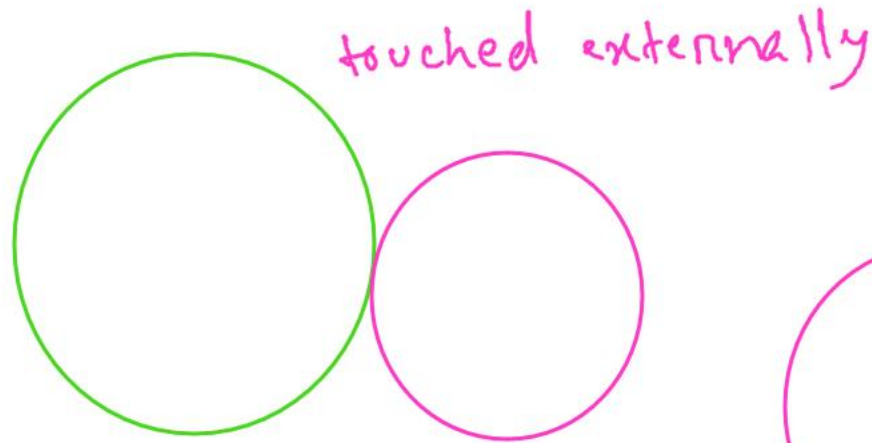
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Theorem-27:

If two circles touch each other externally, the point of contact of the tangent and the centers are collinear.



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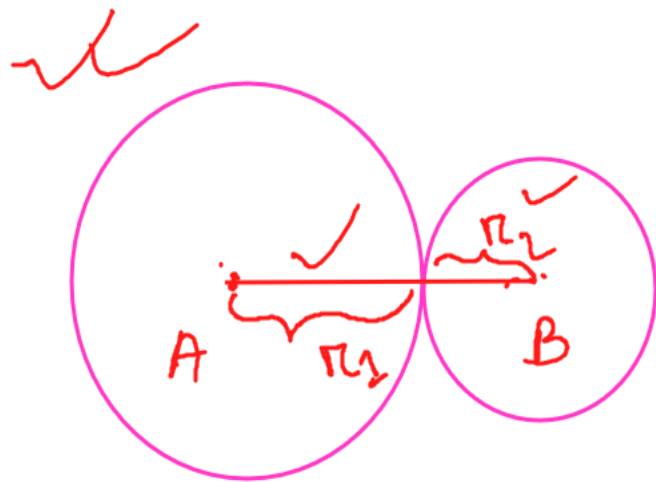
Math

Chapter 8 : Circle

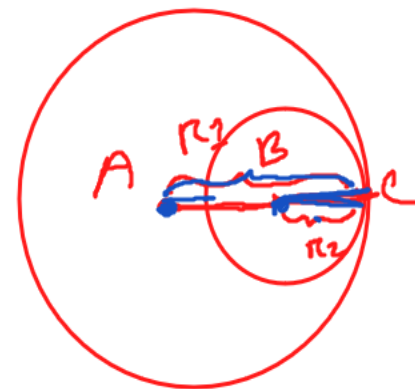
Corollary 11 & 12:

Corollary-11: If two circles touch each other externally, the distance between their centers is equal to the sum of their radii.

Corollary-12: If two circles touch each other internally, the distance between their centers is equal to the difference of their radii.



$$AB = r_1 + r_2$$



$$AB = r_1 - r_2$$



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EXERCISE 8.4

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1. Two tangents are drawn from an external point P to the circle with center O. Prove that OP is the perpendicular bisector of the chord through the touch points.

We have to prove

$$AD = BD$$

$$\angle ADP = \angle BDP = 90^\circ$$

Similarly,

$$\triangle OAP \cong \triangle OBP$$

$$PA = PB$$

$$\angle APD = \angle BPD$$

Step 1

$$\triangle ADP \text{ \& \& } \triangle BDP$$

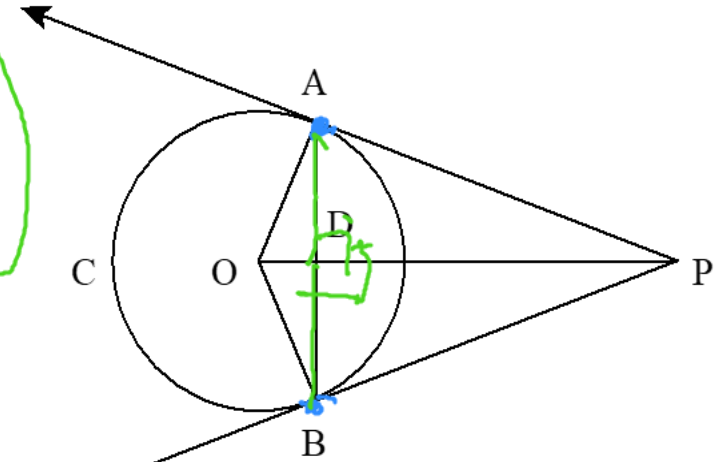
$$PA = PB$$

$$\angle APD = \angle BPD$$

PD common side

$$\therefore \triangle ADP \cong \triangle BDP; [SAS]$$

$$\therefore AD = BD$$



$$\angle ADP = \angle BDP$$

$$\text{But, } \angle ADP + \angle BDP = 180^\circ$$

$$\angle ADP + \angle ADP = 180^\circ$$

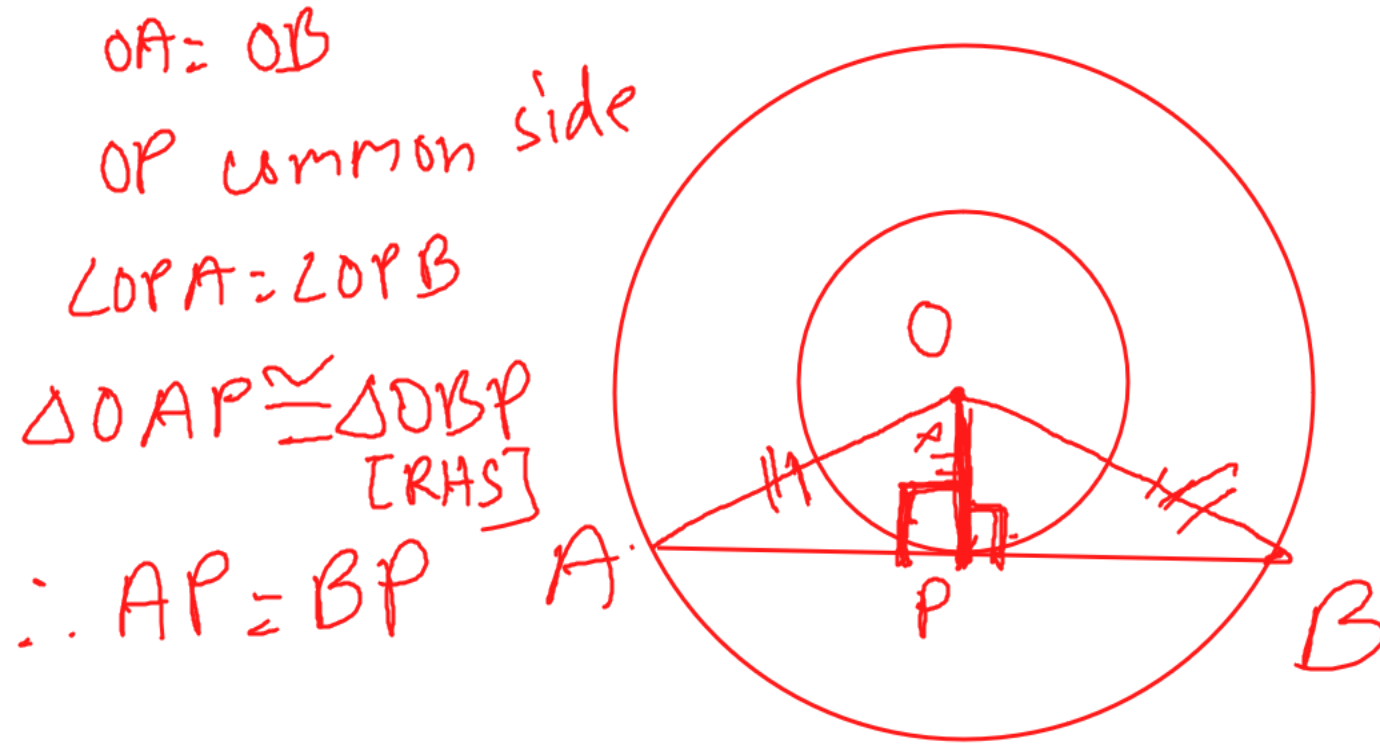
$$2\angle ADP = 180^\circ$$

$$\angle ADP = 90^\circ$$

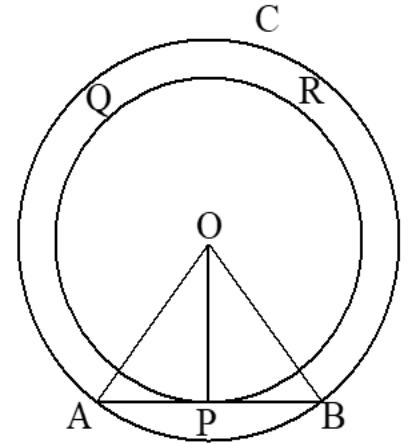


EXERCISE 8.4

2. Prove that, if two circles are concentric and if a chord of the greater circle touches the smaller, the chord is bisected at the point of contact.



$$AP = BP$$

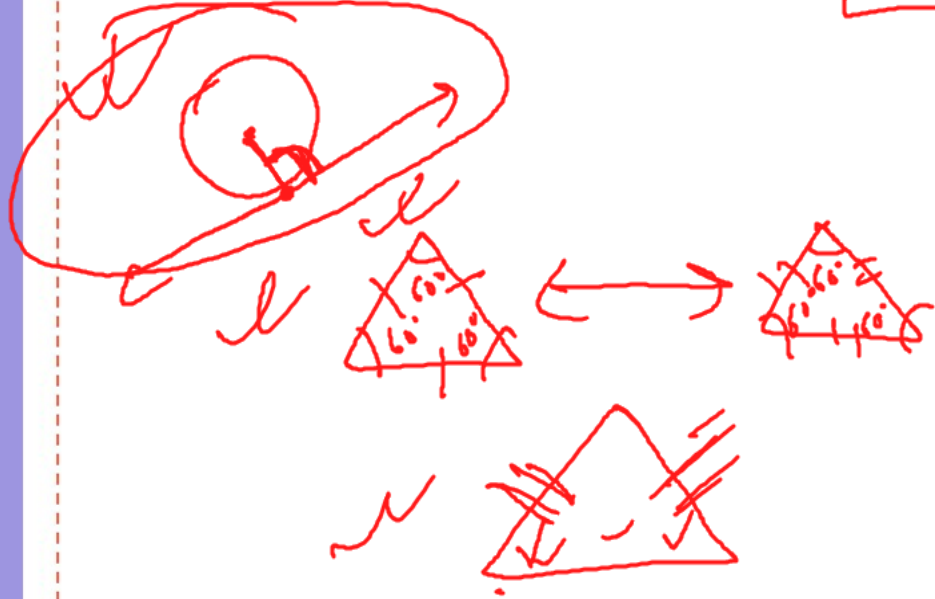


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EXERCISE 8.4

3. AB is a diameter of a circle with center at O and BC is a chord equal to its radius. If the tangents drawn at A and C meet each other at the point D. Prove that, ACD is an equilateral triangle.



$$BC = OC = OB$$

$$\angle OAD = 90^\circ$$

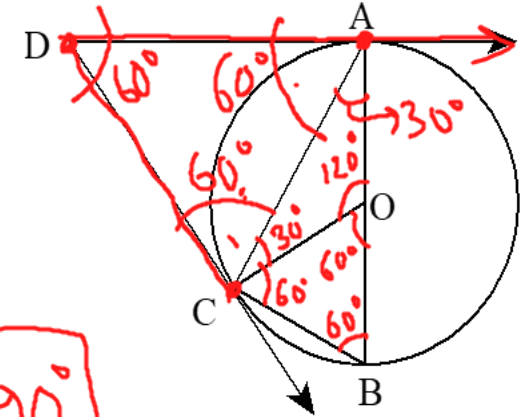
$$\angle OCD = 90^\circ$$

$\triangle ACD$ is an equilateral triangle.

$$\angle OCB = \angle OBC = \angle BOC = 60^\circ$$

$$OA = OC = \text{radius}$$

$$\angle OAC = \angle OCA = 30^\circ$$



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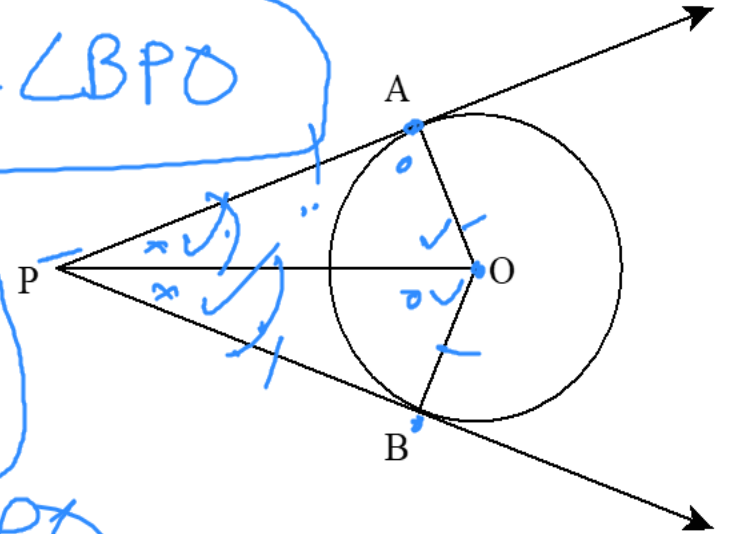
EXERCISE 8.4

6. Given. O is the center of the circle and two tangents PA and PB touches the circle at the point A and B respectively. Prove that, PO is the bisector of $\angle APB$.

We have to prove $\angle APO = \angle BPO$

$$\triangle OAP \cong \triangle OBP$$

$$\therefore \angle APO = \angle BPO$$



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না বুঝে
মুখস্থ করার
অভ্যাস প্রতিভাকে
ধ্বংস করে

$$X = c \rho \frac{V^2}{2} S$$

$$X = c \rho \frac{V^2}{2} S$$

$$E = mc^2$$

$$x = \sqrt{\frac{a^2}{c} + c} - \frac{b}{2}$$



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