

Class 9th Sub - Mathematics Writer - Agarwal
chapter = 14 Arc properties of circles

Ans 1

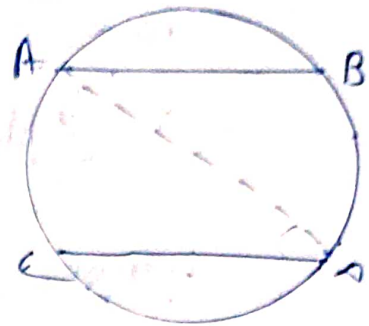
Given that

$$\text{Arc AC} = \text{Arc BD}$$

To prove $\Rightarrow AB \parallel CD$

Now,

$$\text{proof} = \text{Arc AC} = \text{Arc BD}$$



$\therefore \angle ADC = \angle BAD$ (Arcs are equal so its angles also will be equal)

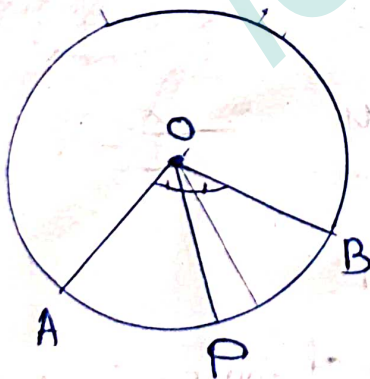
But, these are alternate angles

Therefore $AB \parallel CD$

Proved.

Ans 2. Given that an arc AB

which subtends $\angle AOB$ at centre O is the mid point of AB



Join OP

To prove $\angle AOP = \angle BOP$

Proof: $AC = BC$ (P is the mid point of Arc AB)

these subtend $\angle AOP$ and $\angle BOP$

$\therefore \angle AOP = \angle BOP$ (OP is bisector)

Hence proved.

3 Another given that

P is mid point of arc APB

M is mid point of chord AB

A

Now,

Join AO and BO and produce OM at Q .

(i) $PM \perp AB$

Proof: - Arc $AP = BP$

Therefore $\angle AOP = \angle POB$

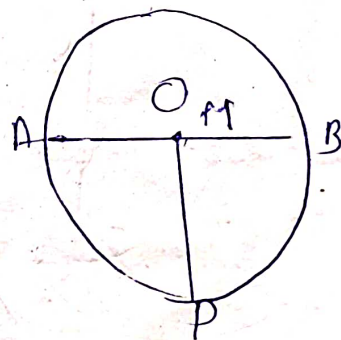
$\angle AOM = \angle BOM$

Now, $\triangle OAM$ and $\triangle OBM$

$OB = OA$ (radius of same circle)

$OM = OM$ (common)

$\angle AOM = \angle BOM$ (prove already)



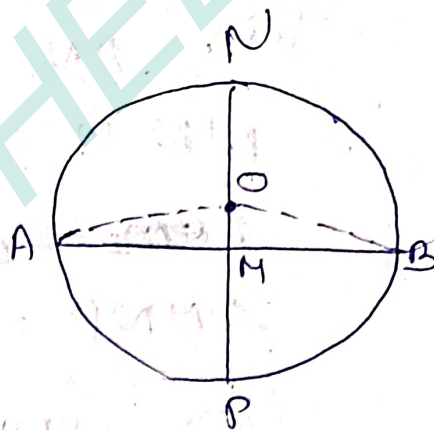
Therefore $\angle BMO = \angle AMO$

As,

$$\angle AMO + \angle BMO = 180^\circ$$

$$\angle AMO = \angle BMO = 90^\circ$$

Hence $MP \perp AB$ or OM



$$(i) \angle AMP + \angle OMA = 90^\circ + 90^\circ \\ \Rightarrow 180^\circ$$

PMO is a straight line. passes through O

(ii) since PO is diameter of circle

$$\text{arc } PAQ = \text{arc } PBQ$$

$$\text{arc } PAQ - \text{arc } AP = \text{arc } PBQ - \text{arc } PB$$

$$(AQ = PB)$$

$$\text{arc } AN = BN$$

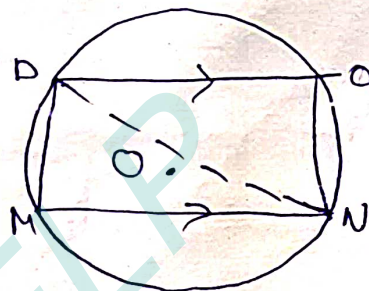
N is the bisector of AB

Proved

Answer Given that $MNOP$ is a cyclic trapezium

$$MN \parallel OP$$

$$\uparrow \text{ to prove } = MP = NO$$



Proof = Join PN

$\therefore MN \parallel OP$ (given)

$$\angle \text{---} = \angle 1$$

$$\angle MNP = \angle OPN \text{ (alternate angles)}$$

these angles subtends by the

Arcs MP and NO

$$\text{arc MP} = \text{arc NO}$$

$$\text{chord MP} = \text{chord NO}$$

[equal arc = equal chord]

Hence $MP = NO$

Proved.

5

A circle has O centre and P is point.

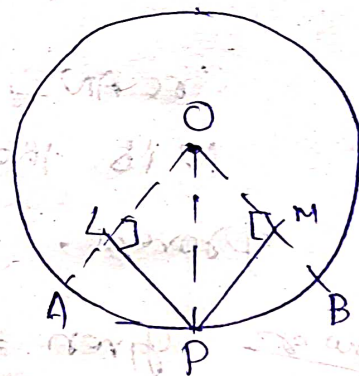
radii is OA and OB

To prove = arc AP = arc PB

Now Join OP

Proof:- in right angled $\triangle OMP$ and $\triangle OBP$

$$OP = OP \text{ (common)}$$



$$PL = PM \text{ (given)}$$

$$\angle LOP = \angle MOP \text{ (given by CPCT)}$$

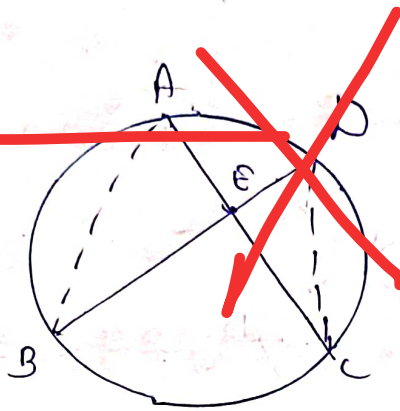
$$\therefore \triangle OLP \cong \triangle OMP \text{ (RHS)}$$

$$\text{or } \angle AOP = \angle BOP$$

$$\text{or } AP = BP \text{ (Because angles are equal so arcs will also)}$$

Proved.

6 Answer



Given that

in a figure, there is two chords AC and BD both intersect to each other at a point E.

$$\text{Arc } AB = \text{Arc } CD$$

$$\text{To prove: } AE = ED$$

$$BE = EC$$

construction = Join CD and AD

proof:

$$\text{Chord } AB = \text{Chord } CD \text{ (given)}$$

$$\text{Arc } AB = \text{Arc } CD \text{ (given)}$$

Now in $\triangle CED$ and $\triangle BEA$