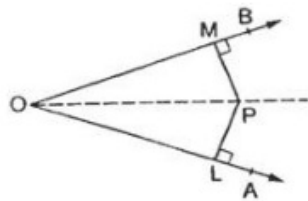




Exercise 5A

Question 31:

Given: An angle AOB and P is a point in the interior of $\angle AOB$ such that $PL=PM$. Also $PL \perp OA$ and $PM \perp OB$



To Prove: $\angle POL = \angle POM$

Proof: In $\triangle OPL$ and $\triangle OPM$, we have

$$\angle OMP = \angle OLP = 90^\circ$$

[Given]

$$OP = OP$$

[Common]

$$PL = PM$$

[Given]

Thus, by Right angle-Hypotenuse-Side criterion of congruence, we have

$$\triangle OPL \cong \triangle OPM$$

[By R.H.S]

The corresponding parts of the congruent triangles are equal.

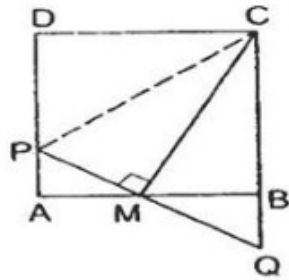
$$\therefore \angle POL = \angle POM$$

[C.P.C.T]

$\Rightarrow OP$ is the bisector of $\angle LOM = \angle AOB$

Question 32:

Given M is the mid-point of side AB of a square ABCD and $CM \perp PQ$



To Prove : (i) $PA = BQ$
(ii) $CP = AB + PA$

Proof: (i) In $\triangle AMP$ and $\triangle BMQ$

$\angle AMP = \angle BMQ$ [Vertically opposite angle]

$\angle PAM = \angle MBQ = 90^\circ$ [\because ABCD is a square]

and $AM = MB$ [Given]

Thus by Angle-Angle-Side criterion of congruence, we have

$\triangle AMP \cong \triangle BMQ$ [By AAS]

The corresponding parts of the congruent triangles are equal.

$\therefore PA = BQ$ and $MP = MQ$ (1)

(ii) Now $\triangle PCM$ and $\triangle QCM$, we have

$PM = QM$ [from (1)]

$\angle PMC = \angle QMC = 90^\circ$ [Given]

$CM = CM$ [Common]

Thus by Side-Angle-Side criterion of congruence we have

$\therefore \triangle PCM \cong \triangle QCM$ [By SAS]

The corresponding parts of the congruent triangles are equal.

So, $PC = QC$ [C.P.C.T]

$\Rightarrow PC = QB + CB$

$\Rightarrow PC = AB + PA$ [$\because AB = CB$ and $PA = QB$]

***** END *****