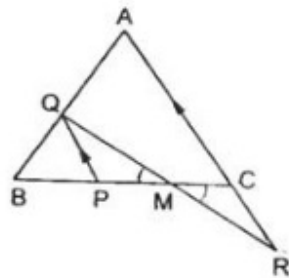




Exercise 5A

Question 28:

A $\triangle ABC$ which is an equilateral triangle and $PQ \parallel AC$.
AC is produced to R such that $CR = BP$



To Prove: $PM = MC$

Proof: Let QR intersects PC at M.

Since $\triangle ABC$ is an equilateral triangle,

$$\Rightarrow \angle A = \angle ACB = 60^\circ$$

Since $PQ \parallel AC$ and corresponding angles are equal.

$$\Rightarrow \angle BPQ = \angle ACB = 60^\circ$$

In $\triangle BPQ$, $\angle B = \angle ACB = 60^\circ$

$$\Rightarrow \angle BQP = 60^\circ$$

$\Rightarrow \triangle BPQ$ is an equilateral triangle

$$\Rightarrow PQ = BP = BQ$$

Since $BP = CR$, we have,

$$PQ = CR \quad \text{.....(1)}$$

Consider the triangles $\triangle PMQ$ and $\triangle CMR$.

Since $PQ \parallel AC$ and QR is a transversal

$$\text{So, } \angle PQM = \angle CRM \quad [\text{alternate angles}]$$

$$\angle PMQ = \angle CMR \quad [\text{vertically opposite angles}]$$

$$PQ = CR \quad [\text{from (1)}]$$

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

$$\triangle PMQ \cong \triangle CMR \quad [\text{By AAS}]$$

The corresponding parts of the congruent triangles are equal.

$$\text{So, } PM = MC \quad [\text{C.P.C.T}](\text{proved})$$

***** END *****

