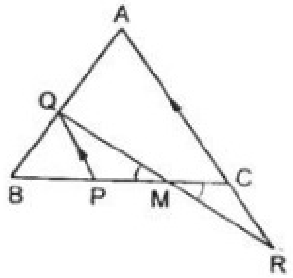
Exercise 5A

Question 28:

A ΔABC which is an equilateral triangle and PQ||AC.

AC is produced to R such that CR=BP



To Prove: PM=MC

Proof: Let QR intersects PC at M.

Since ΔABC 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 ΔBPQ, $\angle B = \angle ACB = 60^\circ$

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

$\Rightarrow \Delta BPQ$ is an equilateral triangle

$\Rightarrow PQ = BP = BQ$

Since BP = CR, we have,

PQ = CR ......(1)

Consider the triangles ΔPMQ and ΔCMR.

Since PQ || AC and QR is a transversal

So, $\angle PQM = \angle CRM$ [alternate angles]

$\angle PMQ = \angle CMR$ [vertically opposite angles]

PQ = CR [from (1)]

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

$\Delta PMQ \cong \Delta CMR$ [By AAS]

The corresponding parts of the congruent triangles are equal.

So, PM = MC [C.P.C.T](proved)

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