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CLASS – 9

MATHEMATICS

Chapter – 7

Triangles

Part –13

Exercise 7.3 (3 to 5)

Vikas Saini

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3. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of $\triangle PQR$. Show that

(i) $\triangle ABM \cong \triangle PQN$

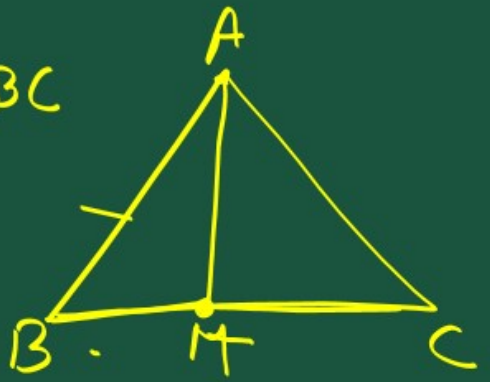
(ii) $\triangle ABC \cong \triangle PQR$

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Given: In $\triangle ABC$, AM is median on BC

$\therefore BM = CM = \frac{BC}{2}$

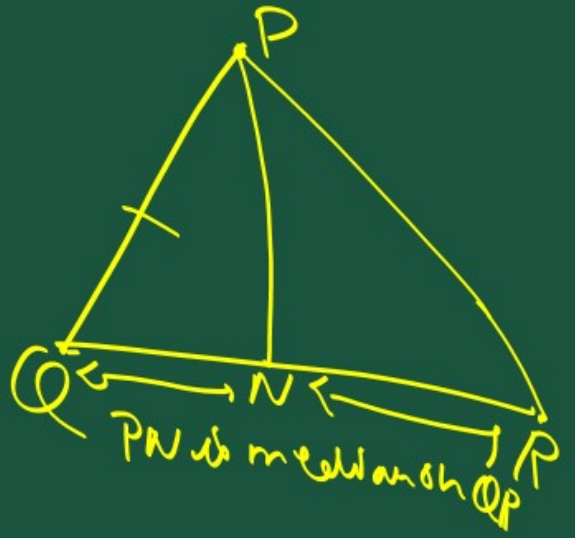


AM is median on BC

IIly In $\triangle PQR$,

PN is median on QR

$\therefore QN = NR = \frac{QR}{2}$



& $AB = PQ$

$BC = QR$

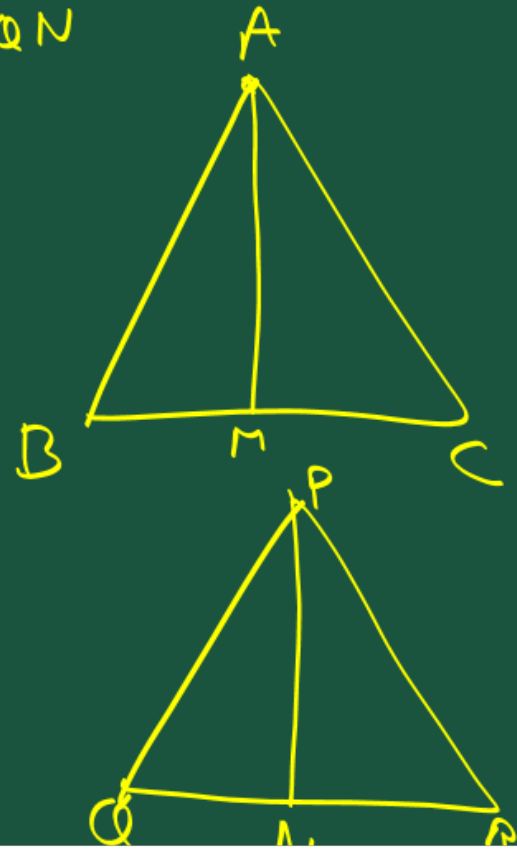
$AM = PN$

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To prove :→ $\triangle ABM \cong \triangle PQN$

$\triangle ABC \cong \triangle PQR$



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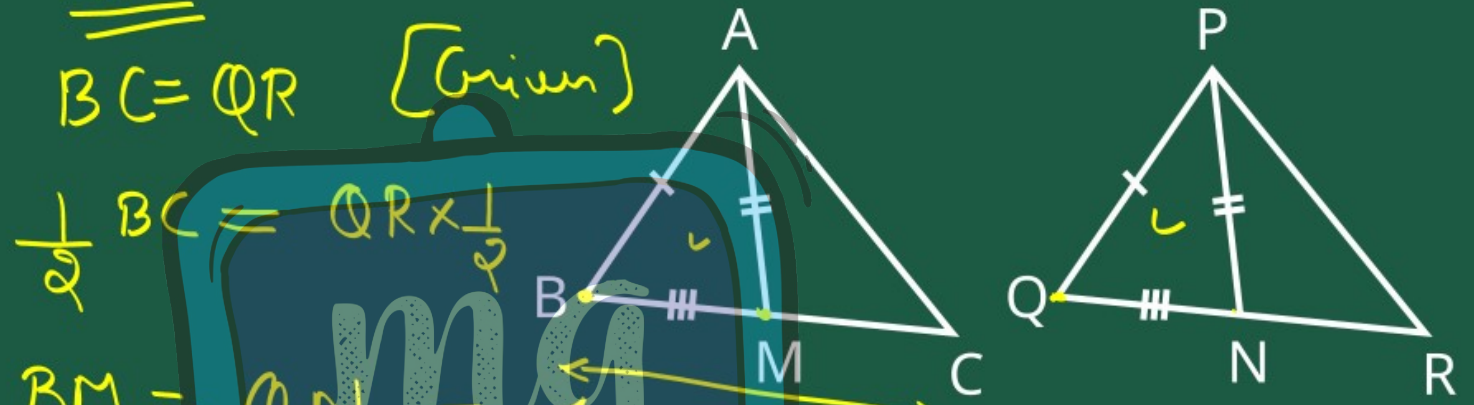
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Sol :→ Since

$BC = QR$ [Given]

$\frac{1}{2} BC = QR \times \frac{1}{2}$

$BM = QN$ [Given]



Now In $\triangle ABM$ & $\triangle PQN$

$AB = PQ$

$AM = PN$ [Given]

$BM = QN$ [Proved above]

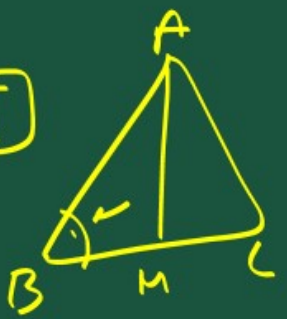
$\therefore \triangle ABM \cong \triangle PQN$ By SSS Congruency Rule

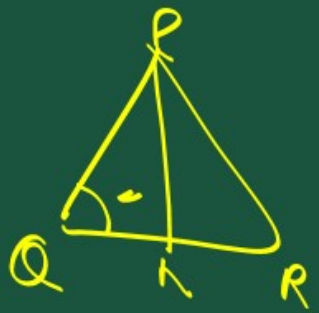
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$\triangle ABM \cong \triangle PQN$

$\angle B = \angle Q$ [C.P.C.T]





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(ii) $\triangle ABC \cong \triangle PQR$

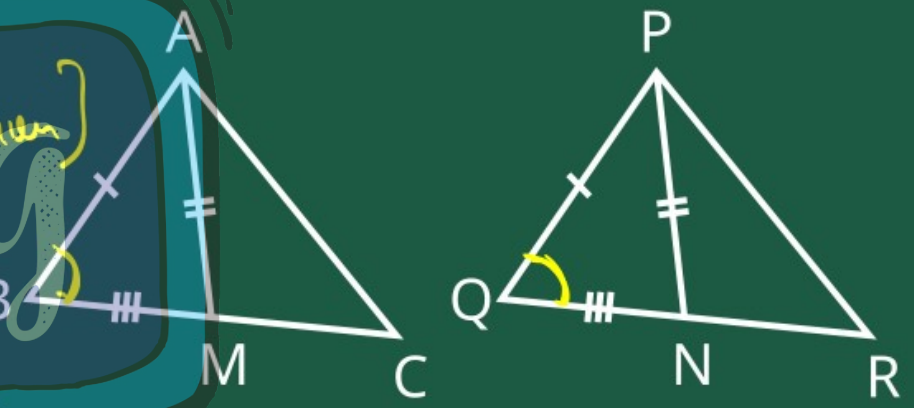
In $\triangle ABC$ & $\triangle PQR$

$AB = PQ$ [Given]

$BC = QR$ [Given]

$\angle B = \angle Q$ [eq(1)]

$\therefore \triangle ABM \cong \triangle PQR$ By SAS Congruency Rule



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4. BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule, prove that the triangle ABC is isosceles.

Given: In $\triangle ABC$,

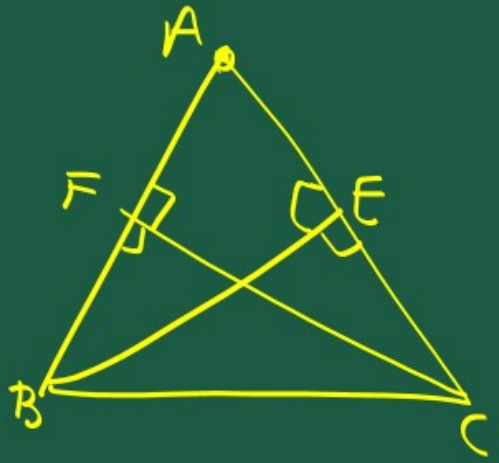
BE is Altitude on AC.

$\therefore \angle BEA = \angle CFB = 90^\circ$

Also CF is altitude on AB

$\angle CFA = \angle CFB = 90^\circ$

& $BE = CF$



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To prove :- $\triangle ABC$ is isosceles $\triangle$.

Soln :- In $\triangle BEC$ & $\triangle CFB$

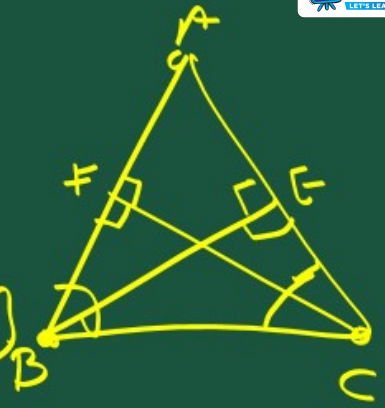
$\angle BEC = \angle CFB = 90^\circ$ [Given]

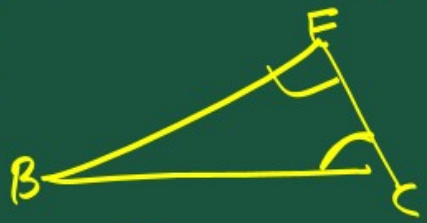
$BC = CB$ [common]

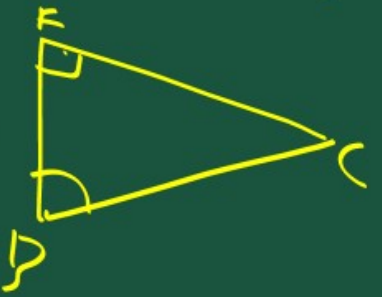
$BF = CE$ [Given]

$\therefore \triangle BEC \cong \triangle CFB$ By R.H.S Longmula Rule

$\angle B = \angle C$ [C.P.C.T]







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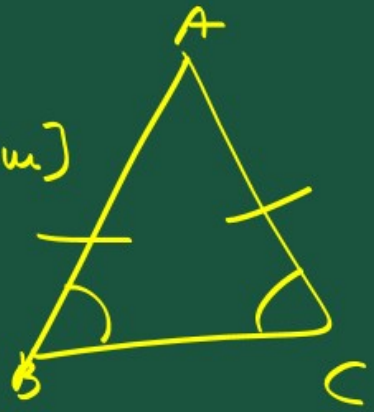
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In $\triangle ABC$,

$\angle B = \angle C$ [Proved above]

$AB = AC$

$\therefore$ $\triangle ABC$ is isosceles $\triangle$



[If opp sides/angles are equal in a $\triangle$ then angles/sides opp. to them are also equal]

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5 ABC is an isosceles triangle with AB = AC. Draw AP ⊥BC to show that ∠B = ∠C.

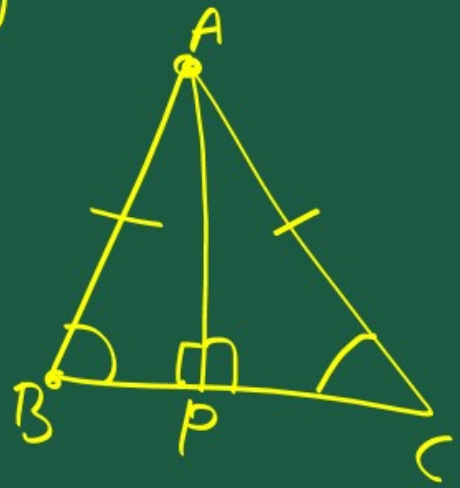
Given :-

$\triangle ABC$ is isosceles Δ

$AB = AC$

& $AP \perp BC$

$\angle APB = \angle APC = 90^\circ$



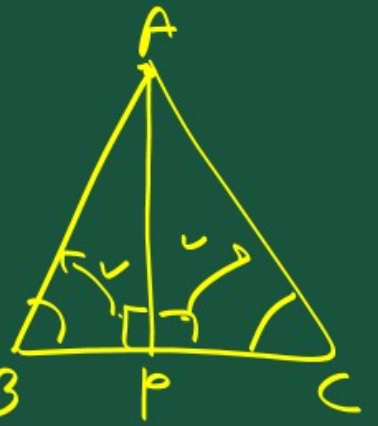
To prove :- $\angle B = \angle C$

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Soln

In $\triangle APB$ & $\triangle APC$



$\angle APB = \angle APC = 90^\circ$ [Given]

$AB = AC$ [Given]

$AP = AP$ [Common]

$\triangle APB \cong \triangle APC$ By R.H.S

$\angle B = \angle C$ [C.P.C.T] Congruence