H.W

Date 6.7.21
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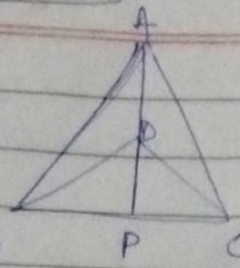
Exercise → 7.3

Q1)



Sol^n :-

ΔABC & ΔDBC are two isosceles triangles.

i) ΔABD & ΔACD are similar by SSS congruency because :-

AD = AD (common arm)
AB = AC (ΔABC is isosceles)
BD = CD (ΔDBC is isosceles)
$\therefore \Delta ABD \cong \Delta ACD$.

ii) ΔABP and ΔACP are similar as :-

AP = AP (common side)
PAB = PAC (by CPCT, since $\Delta ABD \cong \Delta ACD$)
AB = AC (ΔABC is isosceles).

$\Delta ABP \cong \Delta ACP$ by SAS congruency condition.

iii) PAB = PAC by CPCT as,
$\Delta ABD \cong \Delta ACD$

AP bisects A. —(i)

ΔBPD & ΔCPD are similar by SSS congruency as,

PD = PD (common side)
BD = CD (since Δ DBC is isosceles)
BP = CP (by CPCT as $\Delta ABP \cong \Delta ACP$)

So, $\Delta BPD \cong \Delta CPD$

Thus, BDP = CDP by CPCT - (ii)

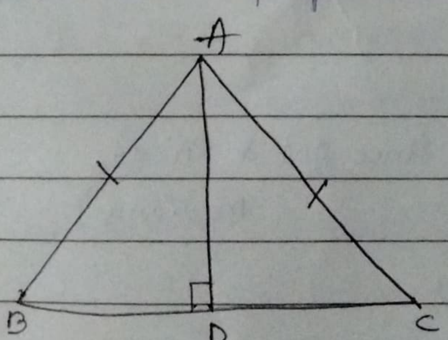
By comparing (i) & (ii), it can be said that AP bisects A as well as D.

iv) BPD = CPD (by CPCT as $\Delta BPD \cong \Delta CPD$)
BP = CP -(i)
also,
BPD + CPD = 180° (BC is a straight line).

$\Rightarrow$ 2 BPD = 180°
BPD = 90° -(ii)

From eqns (i) & (ii), it can be said that,
AP is the perpendicular bisector of BC.

Q2)



i) In Δ ABD & Δ ACD,
ADB = ADC = 90°
AB = AC (given)
AD = AD (common arm)

$\therefore$ $\Delta ABD \cong \Delta ACD$ by RHS congruence condition.

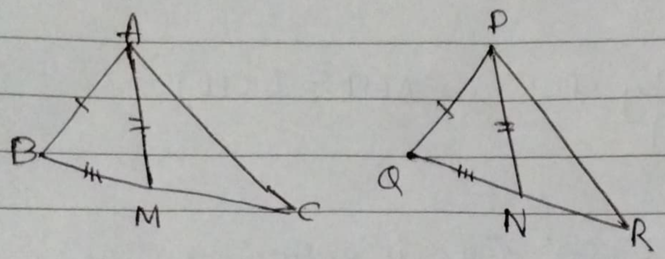
Now, by the rule of CPCT,

$BD = CD$.

So, AD bisects BC.

ii) Again, by the rule of CPCT, $BAD = CAD$.
Hence, AD bisects A.

Q3)



Sol^n :-

Given parameters are :-

$AB = PQ$
$BC = QR$ &
$AM = PN$

i) $\frac{1}{2} BC = BM$ & $\frac{1}{2} QR = QN$ (Since AM & PN are medians)

Also $BC = QR$
So, $\frac{1}{2} BC = \frac{1}{2} QR$
$\Rightarrow BM = QN$

$\Rightarrow$ In ΔABM & ΔPQN,
$AM = PN$
$AB = PQ$ (given)

BM = QN (Already proved)

$\therefore$ $\Delta ABM \cong \Delta PQN$ by SSS congruency.

(ii) In ΔABC & ΔPQR,

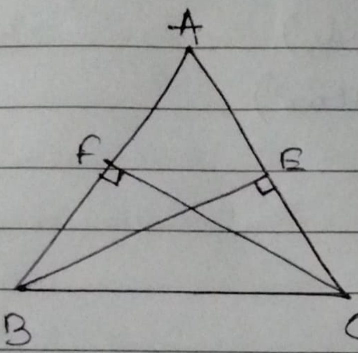
AB = PQ

BC = QR (As given in the question)

ABC = PQR (by CPCT)

So, $\Delta ABC \cong \Delta PQR$ by SAS congruency.

Q4)



Sol^n :-

BE & CF are two equal altitudes

ΔBEC & ΔCFB,

BEC = CFB = 90° (same altitudes).

BC = CB (common side)

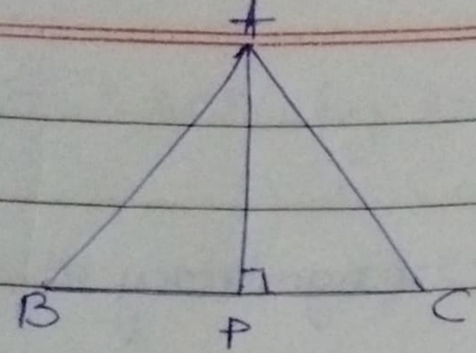
BE = CF (common side).

So, $\Delta BEC \cong \Delta CFB$ by RHS congruence criterion.

Also, C = B (by CPCT)

Therefore, AB = AC as sides opposite to the equal angles is always equal.

Q5>



AB = AC (given)

Now, $\triangle$ ABP & $\triangle$ ACP are similar by RHS congruen
as,

APB = APC = 90° (AP is altitude)
AB = AC (given in the auestion)
AP = AP (common side)
So, $\triangle ABD \cong \triangle ACP$.
$\therefore$ B = C (by CPCT)