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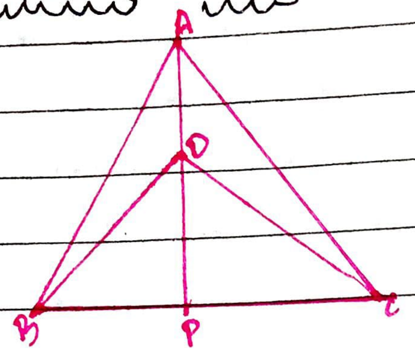
Class - IX 'A'
School no - 2011
Subject - Maths

# Exercise - 7.3

1)




(i) In $\Delta ABD$ and $\Delta ACD$,

$AB = AC$ (Given)

$BD = CD$ (Given)

$AD = AD$ (Common)

$\therefore \Delta ABD \cong \Delta ACD$ (By SSS congruence rule)

$\Rightarrow \angle BAD = \angle CAD$ (By CPCT)

$\Rightarrow \angle BAP = \angle CAP$ ——— (1)

(ii) In $\Delta ABP$ and $\Delta ACP$,

$AB = AC$ (Given)

$\angle BAP = \angle CAP$ [From eqn (1)]

$AP = AP$ (Common)

$\therefore \Delta ABP \cong \Delta ACP$ (SAS congruence rule)

$\Rightarrow BP = CP$ (CPCT) ——— (2)

(iii) From equation (1)

$\angle BAP = \angle CAP$

Hence AP bisect $\angle A$

In $\Delta BDP$ and $\Delta CDP$

$BD = CD$ (Given)

$DP = DP$ (Common)

$BP = CP$ [From eqn (2)]

$\therefore \Delta BDP \cong \Delta CDP$ (S.S.S congruence rule)

$\Rightarrow \angle BDP = \angle CDP$ (By CPCT) ——— (3)

Hence AP bisect $\angle D$

(iv) $\Delta BDP \cong \Delta CDP$

$\therefore \angle BPD = \angle CPD$ (CPCT) —— (4)

$\angle BPD + \angle CPD = 180°$ (Linear Pair)

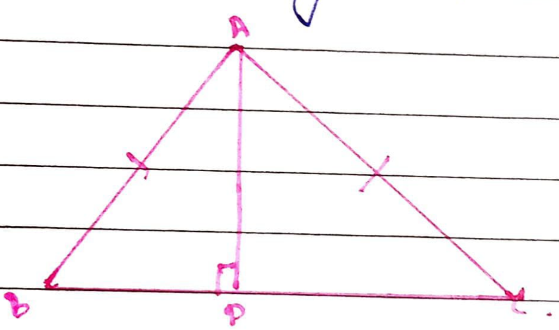
$\angle BPD + \angle BPD = 180°$

$2\angle BPD = 180°$ (From eqn (4))

$\angle BPD = 90°$ —— (5)

From eqn (2) and (5)
it is said that AP is perpendicular bisector of BC.

2)




(i) In $\Delta BAD$ and $\Delta CAD$

$\angle ADB = \angle ADC$ (each $90°$ as AD is an altitude)

$AB = AC$ (Given)

$AD = AD$ (common)

$\therefore \Delta BAD \cong \Delta CAD$ (RHS congruence rule)

$\Rightarrow BD = CD$ (By CPCT)

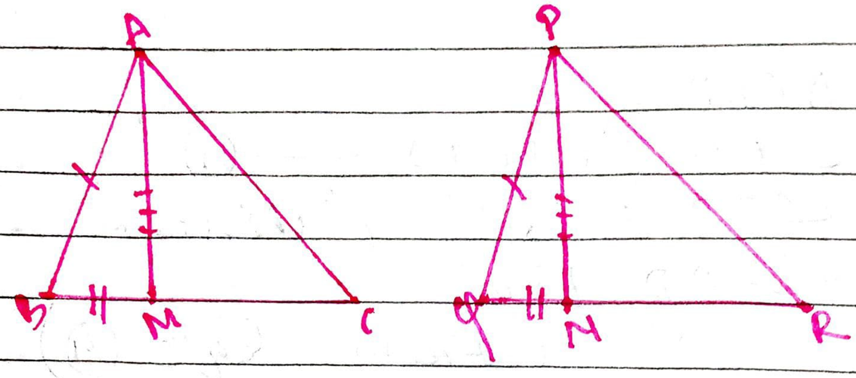
Hence AD bisect BC.

(ii) Also, by CPCT,

$\angle BAD = \angle CAD$

Hence AD bisect $\angle A$.

3)




(i) In $\Delta ABC$, AM is the median to BC.

$\therefore BM = \frac{1}{2} BC$

In $\Delta PQR$, PN is the median to QR.

$\therefore QN = \frac{1}{2} QR$

However, $BC = QR$

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

$\Rightarrow BM = QN$ —— (1)

In $\Delta ABM$ & $\Delta PQN$,
$AB = PQ$ (Given)
$BM = QN$ (From eqn (1))
$AM = PN$ (Given)
$\therefore \Delta ABM \cong \Delta PQN$ (SSS congruence rule)
$\angle ABM = \angle PQN$ (CPCT)
$\angle ABC = \angle PQR$ —— (2)

(ii) In $\Delta ABC$ and $\Delta PQR$,

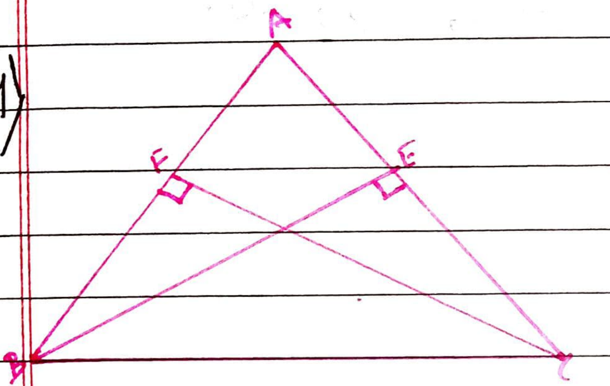
$AB = PQ$ (Given)

$\angle ABC = \angle PQR$ (Eq$^n$ 2)

$BC = QR$ (Given)

$\Rightarrow$ $\Delta ABC \cong \Delta PQR$ (SAS Congruence rule)

4)




In $\Delta BEC$ and $\Delta CFB$,

$\angle BEC = \angle CFB$ (Each $90^\circ$)

$BC = CB$ (Common)

$BE = CF$ (Given)

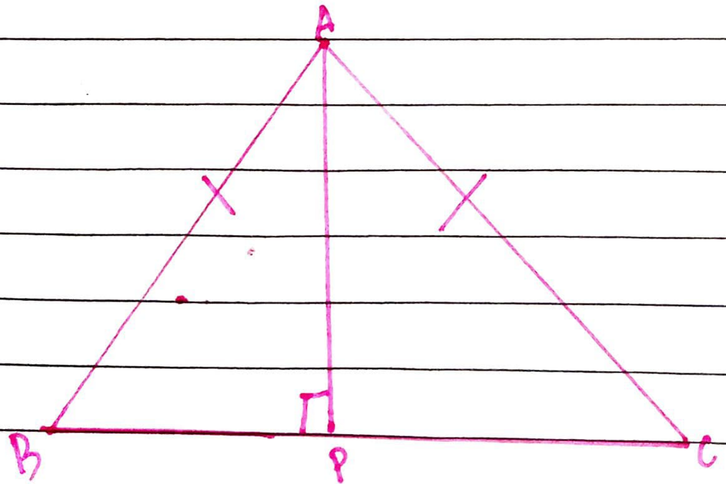
$\therefore$ $\Delta BEC \cong \Delta CFB$ (RHS Congruence rule)

$\Rightarrow$ $\angle BCE = \angle CBF$ (By CPCT)

$\therefore$ $AB = AC$ (Side opposite to equal angles of a triangle are equal)

Hence, $\Delta ABC$ is isosceles.

5)



In $\Delta APB$ and $\Delta APC$,

$\angle APB = \angle APC$ (each $90^\circ$)

$AB = AC$ (Given)

$AP = AP$ (common)

$\therefore \Delta APB \cong \Delta APC$ (using RHS congruence rule)

$\Rightarrow \angle B = \angle C$ (By using CPCT)