07.07.21 ch - 7

Triangles

Home Assignment

Exercise - 7.3

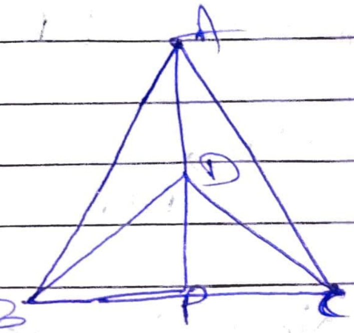
Show that

Ans 1, (i) $\Delta ABD \cong \Delta ACD$

(ii) $\Delta ABP \cong \Delta ACP$

(iii) AP bisects $\angle A$ as well as $\angle D$

(iv) AP is the perpendicular bisector of BC



→ (i) ΔABD and ΔACD are similar by SSS congruency because:-

AD = AD (common)

AB = AC (since ΔABC is isosceles)

BD = CD (since ΔDBC is isosceles)

$\therefore \Delta ABD \cong \Delta ACD$

(ii) ΔABP and ΔACP are similar as

AP and AP (common)

$\angle PAB = \angle PAC$ (CPCT)

AB = AC (since ΔABC is isosceles)

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

(iii) PAB = PAC by CPCT as ΔABD, ΔACD,

AP bisects A. ———— (1)

Also, ΔBPD and ΔCPD are similar by SSS congruency as

PD = PD (common)

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BD = CD (Since $\triangle DBC$ is isosceles)
BP = CP (by CPCT as $\triangle ABP$, $\triangle ACP$)

So, $\triangle BPD$, $\triangle CPD$.

Thus,
BDP = CDP by CPCT ---- (ii)

Now by comparing (i) and (ii) it can be said that AP bisects ∠A as well as ∠D.

(iv) BPD = CPD (by CPCT As $\triangle BPD$, $\triangle CPD$)
and BP = CP ---(1)

also,
BPD + CPD = 180° (Since BC is a ~~stra~~ straight line.)

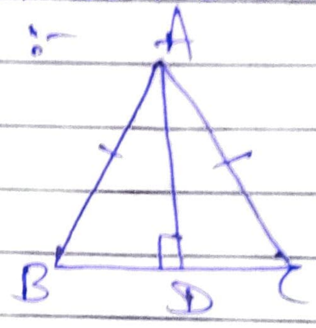
⇒ 2 BPD = 180°
⇒ BPD = 90° --- (ii)

Now from equations (i) and (ii) it can be said that

AP is the perpendicular bisector of BC.

2Ans. Show that
(i) AD bisects BC
(ii) AD bisects A.

→ It is given that ~~to~~ AD is an altitude and AB = AC. The diagram is :-



→ i) In $\triangle ABD$ and $\triangle ACD$,
ADB = ADC = 90°
AB = AC (given)
AD = AD (common)

∴ △ ABD, △ 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.