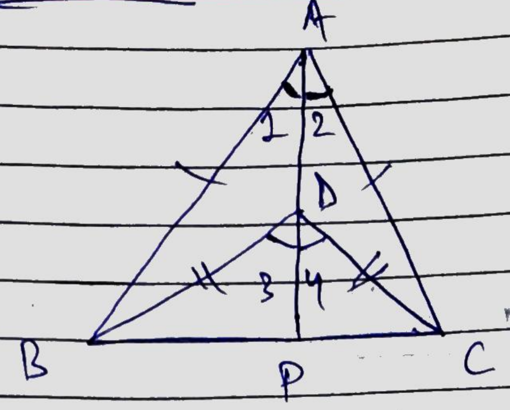
Ex. 7.3

1.



Ans- Given :- AB = AC , DB = DC

To prove :- i. $\Delta ABD \cong \Delta ACD$
ii. $\Delta ABP \cong \Delta ACP$
iii. AP bisects $\angle A$ & $\angle D$
iv. AP is the perpendicular bisector of BC.

Proof :- In ΔABD & ΔACD
AB = AC (Given)
DB = DC (Given)
AD = DA (Common)

$\therefore$ ~~A~~ $\Delta ABD \cong \Delta ACD$ (SSS)
$\angle 1 = \angle 2$ (CPCT) ——— (i)

In ΔABP & ΔACP
AB = AC (Given)
AP = PA (common)
$\angle 1 = \angle 2$ (Proved earlier)

$\therefore$ $\Delta ABP \cong \Delta ACP$ (SAS)
~~$\angle 3 = \angle 4$ (CPCT)~~
PB = PC (CPCT)

$\angle APB = \angle APC$ (CPCT)

$\angle APB + \angle APC = 180°$ (Linear pair)

$\Rightarrow \angle APB = \angle APC = \frac{\cancel{180°}}{\cancel{2}} 90°$

$\Rightarrow$ ~~So~~ AP is the perpendicular bisector of ~~$\angle A$~~ BC.

In $\triangle BDP$ & $\triangle CDP$

BD = CD (Given)

DP = DP (common)

~~$\angle AP$~~ $\angle DPB = \angle BPC = 90°$

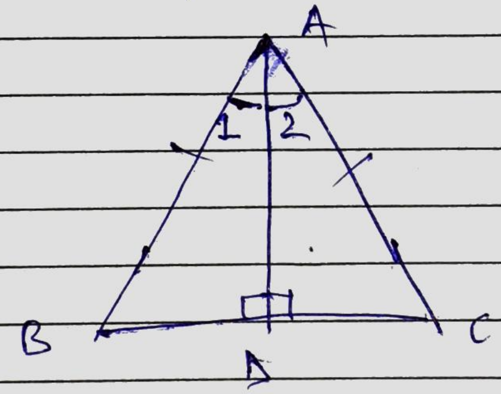
$\therefore$ $\triangle BDP$ & $\triangle CDP$ ~~(SAS)~~ (RHS)

$\angle 3 = \angle 4$ (CPCT) ——— (ii)

From (i) & (ii)

AP bisects $\angle A$ & $\angle D$.

2.



Ans. Given :- In $\triangle ABC$, AB = AC, AD $\perp$ BC

To prove :- i. AD bisects ~~$\angle$~~ BC (DB = BC)

ii. AD bisects $\angle A$ ($\angle 1 = \angle 2$)

Proof:- In Δ ~~BP~~ ABD & Δ ACD

$AB = AC$ (Given)

$AD = DA$ (common)

$\angle ADB = \angle ADC$ (90°)

$\therefore \Delta ABD \cong \Delta ACD$ (RHS)

$DB = DC$ (CPCT)

$\angle 1 = \angle 2$ (CPCT)

AD bisects $\angle A$.