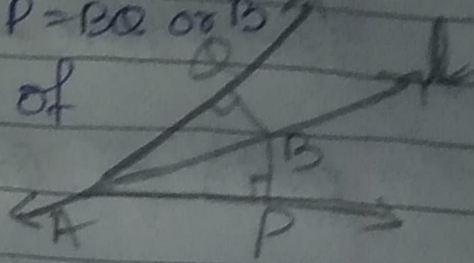
5) Line l is the bisector of an angle $\angle A$ and B is any point on l. BP and BQ are perpendiculars from B to the arms of $\angle A$. Show that: i) $\Delta APB \cong \Delta AQB$
ii) $BP = BQ$ or B is equidistant from the arms of $\angle A$.



⇒ Given :- l is the bisector of $\angle A$

So, $\angle PAB = \angle QAB$

BP & BQ are perpendiculars from B,

So, $\angle APB = \angle AQB = 90^\circ$

To prove :- (i) $\Delta APB \cong \Delta AQB$
ii) $BP = BQ$.

Proof :- In ΔAPB and ΔAQB

$\angle APB = \angle AQB$ (90°)

$\angle PAB = \angle QAB$ (given)

$AB = AB$ (common)

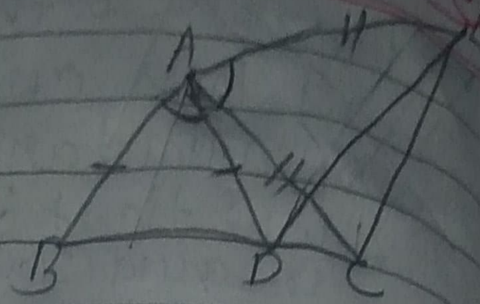
$\therefore \Delta APB \cong \Delta AQB$ (AAS)

$\therefore BP = BQ$ (cpct)

Hence proved.

6) In fig, $AC = AE$, $AB = AD$ and $\angle BAD = \angle EAC$. Show that $BC = DE$.

Given - $AC = AE$
$AD = AB$
$\angle BAD = \angle EAC$



To Prove :- $BC = DE$

proof :- Given that

$\angle BAD = \angle EAC$

$\angle BAD + \angle DAC = \angle EAC + \angle DAC$

$\angle BAC = \angle DAE$

Adding $\angle DAC$, on both the sides.

In $\triangle ABC$ and $\triangle ADE$

$AB = AD$ (Given)

$\angle BAC = \angle DAE$ (proved earlier)

$AC = AE$ (given)

$\therefore \triangle ABC \cong \triangle ADE$ (SAS)

$\therefore BC = DE$ (cpct)

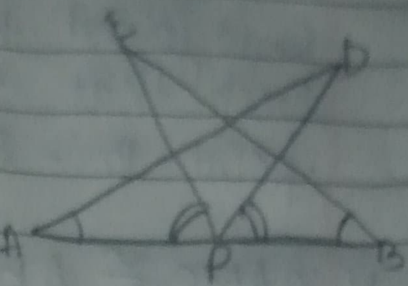
Hence proved.

7) AB is a line segment and p is its mid-point. D and E are points on the same side of

AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$. Show that:

i) $\Delta DAP \cong \Delta EBP$

ii) $AD = BE$



⇒ Given -: P is the mid point of AB

So, $AP = BP$ (Given)

$\angle BAD = \angle ABE$ (given)

$\angle EPA = \angle DPB$ (given)

To prove -> i) $\Delta DAP \cong \Delta EBP$ ii) $AD = BE$

proof -: $\angle EPA = \angle DPB$

We add $\angle DPE$ both sides.

$\angle EPA + \angle DPE = \angle DPB + \angle DPE$

$\angle DPA = \angle EPB$

In ΔDPA and ΔEBP,

$\angle BAP = \angle EBP$ (given)

$AP = BP$ (given)

$\angle DPA = \angle EPB$ (proved earlier)

$\therefore \Delta DAP \cong \Delta EBP$ (ASA)

$\therefore AD = BE$ (cpct)