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5) Line l is the bisector of an angle A and B is any point on l. BP and BQ are ~~perpendicular~~ perpendiculars from B to the arms of A (see Fig. 7.20). Show that: i- $\Delta ABP \cong \Delta AQB$

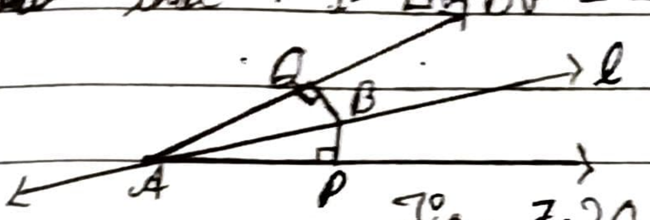

Fig. 7.20

ii- $BP = BQ$ or B is equidistant from the arms of A

Ans) It is given that the line "l" is the bisector of angle A and the line segment BP and BQ are perpendiculars drawn from l.

i- ~~AB~~ ΔAPB and ΔAQB are similar by AAS congruency because:
$P = Q$ (They are two ~~to~~ right angles)
$AB = AB$ (it is the common arm)
$BAP =$ ~~BQ~~ BAQ (As line l is the bisector of angle A)
So,
$$\Delta BQA \cong \Delta APB$$

ii- By the Rule of CPCT, $BP = BQ$.
~~So~~, it can be said the point B is equidistant from ~~on~~ arms of A.

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6) In Fig 7.21, $AC = AE$, $AB = AD$ and ~~BAD = EAC~~ $BAD = EAC$. Show that $BC = DE$.

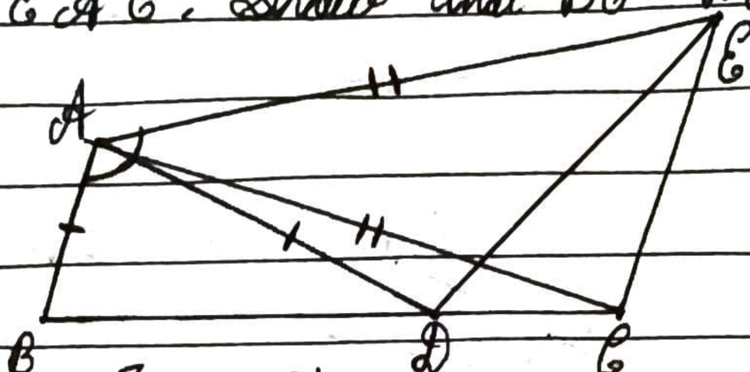

Fig. 7.21

ans) It is given in the question that
$AB = AD$, $AC = AE$, and $\angle BAD = \angle EAC$

To prove:

The line segment BC and DE are similar i.e., $BC = DE$.

Proof:

We know that ~~BAD =~~ $BAD = EAC$

By adding DAC, we get,

$BAD + DAC = DAC + CAE$

$\Rightarrow BAC = EAD$

Now, ΔABC and ΔADE are similar by SAS.

i- $AC = AE$ (Given)

ii- $BAC = EAD$

iii- $AB = AD$ (Given)

$\therefore$ ΔABC and ΔADE are similar

i.e., $\Delta ABC \cong \Delta ADE$.

So,

by the rule of CPCT, it can be said that $BC = DE$.

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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 ~~∠BAD = ∠ABE~~ $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$ (see Fig. 7.22).
Show that:- i- $\Delta DAP \cong \Delta EBP$
ii- $AD = BE$

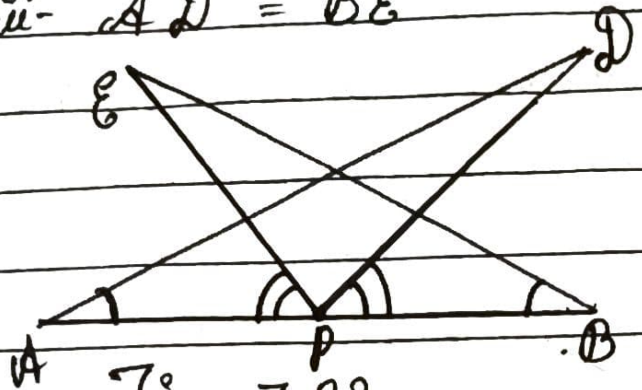

Fig. 7.22

ans) In the question, it is given that P is the midpoint of line segment AB. Also, $BAD = ABE$ and $\angle EPA = \angle DPB$

i- It is given that $\angle EPA = \angle DPB$
Now adding $\angle DPE$ on the both sides, we get,
$\angle EPA + \angle DPE = \angle DPB + \angle DPE$
$\Rightarrow \angle DPA = \angle EPB$
Now consider the triangles DAP and EBP.
$\Delta DAP \cong \Delta EBP$
$AP = BP$ (Since P is the mid-point)
$BAD = ABE$ (As given in the Q)
So, by ASA $\Delta DAP \cong \Delta EBP$.

ii- By the rule of CPCT, $AD = BE$.