7.1

6) Sol

$\angle BAD = \angle EAC$ [Given]

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

[adding $\angle DAC$ to both sides]

$\Rightarrow \angle BAC = \angle EAC$

Now in $\triangle ABC$ and $\triangle ADE$

$AB = AD$
$AC = AE$
$\angle BAC = \angle DAE$
$\triangle ABC \cong \triangle ADE$ [By SAS congru
$BC = DE$ (CPCT)

7) In $\triangle DAP$ and $\triangle EBP$ we have

$AP = BP$ [$\because$ P is the ~~main~~ mid point of line segment AB

$\angle BAD = \angle ABE$
$\angle EPB = \angle DPA$

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

$\therefore \triangle DPA = \triangle EPB$
$\Rightarrow AD = BE$ By (CPCT)

8.) In $\triangle BMD$ and $\triangle DMC$ we have

(i) $DM = CM$

$BM = AM$

$\angle DMB = \angle AMC$

[Vertically opposite angle]

$\therefore \triangle AMC \cong \triangle BMD$ [By SAS]

(ii) $AC \parallel BD$

$\Rightarrow \angle DBC + \angle ACB = 180^\circ$

$\angle DBC = 90^\circ$

(iii) In $\triangle DBC$ and $\triangle ACB$, we have

$DB = AC$

$BC = BC$

$\angle DBC = \angle ACB$

$\therefore \triangle DBC = \triangle ACB$

$AB = CD$

$\Rightarrow \frac{1}{2} AB = \frac{1}{2} CD$

Hence $\frac{1}{2} AB = CM$.

1/07/21.

5.) In ΔAPB and ΔAQB we have

$\angle PAB = \angle QAB$ [l is the bisector of $\angle A$]

$\angle APB = \angle AQB$ [Each $= 90^\circ$]

$AB = AB$

$\therefore \Delta APB \cong \Delta AQB$ [By AAS congruence]

Also, $BP = BQ$ [By CPCT]

i.e. B is equidistant from the arms of $\angle A$.