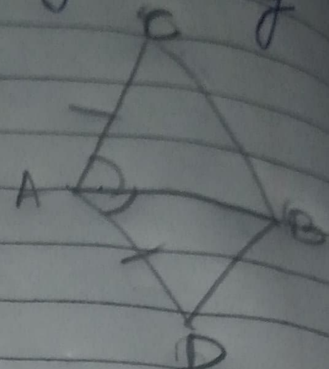
30/8/21

Triangles

HW Exercise 7.1

1) In quadrilateral ABCD, AC = AD and AB bisect ∠A. Show that $\triangle ABC \cong \triangle ABD$. What can you say about BC and BD.



=> Given -: AC = AD

AB bisects ∠A

To prove -: $\triangle ABC \cong \triangle ABD$

proof -: In $\triangle ABC$ and $\triangle ABD$

AC = AD (given)

~~AD~~ AB = AB (common)

∠BAC = ∠BAD (AB bisects ∠A)

$\triangle ABC \cong \triangle ABD$ (SAS)

BC = BD (CPCT)

2) ABCD is a quadrilateral in which AD = BC and ∠DAB = ∠CBA. Prove that fig

i) $\triangle ABD \cong \triangle BAC$

ii) BD = AC

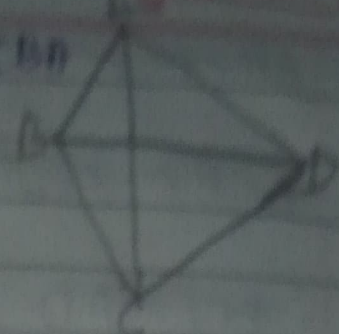
iii) ∠ABD = ∠BAC.

$\Rightarrow$ Given :- $AD = BC$, $\angle DAB = \angle CBA$

To prove :- (i) $\triangle ABD \cong \triangle BAC$,

ii) $BD = AC$

iii) $\angle ABD = \angle BAC$



Proof :- In $\triangle ABD$ and $\triangle BAC$

$AD = BC$ (given)

$\angle DAB = \angle CBA$ (given)

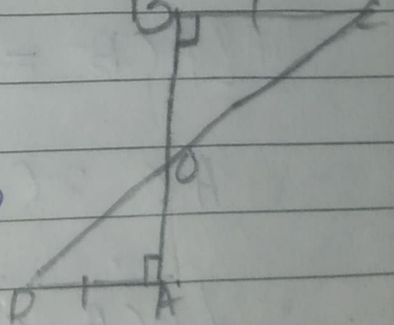
$BD = BD$ (commons)

$\triangle ABD \cong \triangle BAC$ (SAS)

$\therefore BD = AC$ (cpct)

and $\angle ABD = \angle BAC$ (cpct)

3) AD and BC are equal perpendicular to a line segment AB. Show that CD bisects AB.



$\Rightarrow$ Given :- $AD \perp AB$, $BD \perp AB$

$AD = BC$.

To prove :- CD bisects AB.

$OA = OB$

proof :- In $\triangle BOC$ and $\triangle AOD$

$\angle BOC = \angle AOD$ (vertically opposite angles)

$\angle CBO = \angle DAO$ (90°)

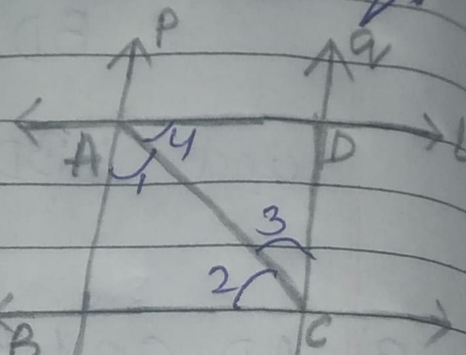
$BC = AD$ (given)

$\therefore \triangle BOC \cong \triangle AOD$ (AAS)

$\therefore BO = AO$ (cpct)

CD bisects AB is proved.

4) l and m are two parallel lines interested by another pair of parallel lines p and q. Show that $\triangle ABC \cong \triangle CDA$.



$\Rightarrow$ Given :- $l \parallel m$ & $p \parallel q$

To prove :- $\triangle ABC \cong \triangle CDA$

proof :- In $\triangle ABC$ and $\triangle CDA$

$\angle ACB = \angle CAD$ (alternate angle)

$AC = CA$ (common)

$\angle BCA = \angle DAC$ (alternate angle)

$\therefore \triangle ABC \cong \triangle CDA$ (ASA)

Hence proved.