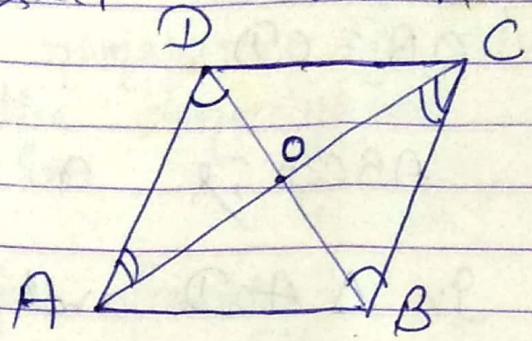
30/08/XX Class-IX^{sc} (MATHS) K.Kanhaiya

Maths

1) The diagonals of a parallelogram bisect each other



Ans → In $\triangle AOD$ and $\triangle BOC$

$AD = BC$ {$\because$ opp sides of 11^{gm} are equal}

$\angle ADO = \angle OBC$ (Alt^{n} int $\angle$s)

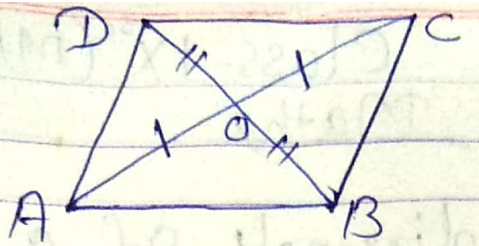
$\angle OAD = \angle OCB$ (" ")

$\therefore \triangle AOD \cong \triangle COB$ by ASA

by C.P.C.T $OA = OC$ and $OD = OB$

2) If the diagonals of a quad bisect each other, then it is a parallelogram.

Ans→



Given:- $OA = OC$
$OB = OD$

To prove ABCD is a $||^{gm}$.

Proof:- In ΔAOD and ΔBOC

$OD = OB$ {Given}
$OA = OC$ {Given}
$\angle AOD = \angle BOC$ {V.O.P.}

$\therefore \Delta AOD \cong \Delta COB$ by SAS

By C.P.C.T

$\angle ODA = \angle OBC$
$AD = CB$

By Converse of alt^{n} angle theorem.

$AD \parallel BC$

So, $AD = BC$, $AD \parallel BC$

$\therefore$ ABCD is a $||^{gm}$.