



Exercise 9C

Question 12:

Given: A quadrilateral $ABCD$ in which H, L, G and K are the midpoints of AB, BC, CD and AD .
Points G and H are joined and K and L are joined.

To prove : GH and KL bisect each other.

Construction : Join KH, BD and GL .

Proof : Since K and H are the mid points of AD and AB .

So in $\triangle ABD$, by mid point theorem,

$$\Rightarrow KH = \frac{1}{2} BD$$

Similarly, in $\triangle CBD$,

$$GL = \frac{1}{2} BD$$

$$\Rightarrow KH = GL$$

Now in $\triangle KOH$ and $\triangle GOL$, we have

$$KH = GL$$

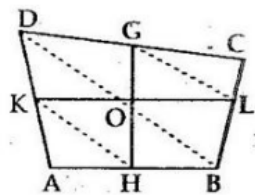
$$\angle OKH = \angle GLO \quad [\text{Alternate angles}]$$

$$\angle OHK = \angle OGL \quad [\text{Alternate angles}]$$

$$\therefore \triangle KOH = \triangle GOL \quad [\text{SAS}]$$

$$\Rightarrow OK = OL \text{ and } OG = OH \quad [\text{C.P.C.T.}]$$

$$\therefore GH \text{ and } KL \text{ bisect each other.}$$



***** END *****