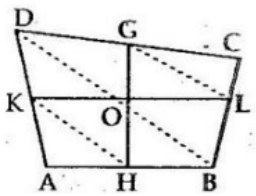
Exercise 9C

Question 12:

Given: A quadrilateral ABCD in which H, L, G and K are the mid points 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 ΔABD, by mid point theorem,

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

Similarly, in ΔCBD,

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

$\Rightarrow \quad KH = GL$

Now in ΔKOH and ΔGOL, we have

$KH = GL$
$\angle OKH = \angle GLO$ [Alternate angles]
$\angle OHK = \angle OGL$ [Alternate angles]
$\therefore \quad \Delta KOH = \Delta GOL$ [SAS]
$\Rightarrow \quad OK = OL$ and $OG = OH$ [C.P.C.T.]
$\therefore \quad$ GH and KL bisect each other.

********** END **********