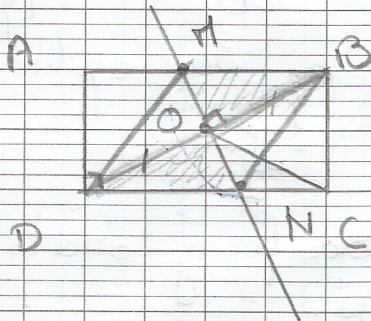


6th exercise:

~~1. MN~~ ~~2. MN~~ ~~3. MN~~



a) Consider the 2 ΔMOB & ΔNOD :

$\angle MOB = \angle DON = 90^\circ$ ($MN \perp BD$ at O).

$OB = OD$ (O midpoint of diagonals).

$\angle MBO = \angle OND$ (alternate interior angles formed between 2 parallel straight lines $(AB) \parallel (DC)$ and a transversal (BD)).

So, ΔMOB & ΔNOD are congruent by ASA.

By corresponding elements of congruent Δ : $BM = DN$

b) In quadrilateral $MBND$ we have:

$BM = DN$ (proved) but, in ΔMBN : BO is the height & median. So ΔMBN is isosceles at B .

O is the midpoint of the 2 diagonals (BD) (given) & MN ($OM = ON$ by ~~congruency~~ corresponding elements).

Since, Diagonals bisect each other at their midpoint O .

So, $MBND$ is a ~~parallelogram~~

but with 2 adjacent sides equal: $BM = BN$.

So, $MBND$ is a rhombus.

3) In ΔOBC we have:

$OB = BC$ ($BC = \frac{BD}{2}$)

O is the midpoint of (BD) &

So, ΔOBC is isosceles at B