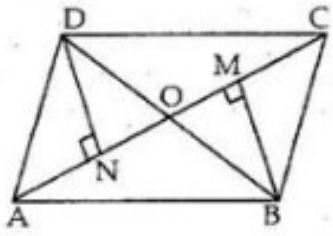
Exercise 9A

Question 5:

Given: $BM \perp AC$ and $DN \perp AC$ and $BM = DN$



To Prove : AC bisects BD.

We have,

$\angle DON = \angle MOB$ [Vertically opposite angles]

$\angle DNO = \angle BMO = 90°$

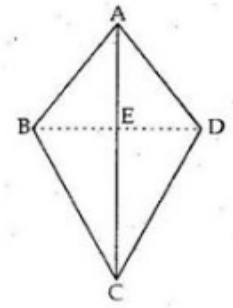
$BM = DN$ [Given]

$\therefore \Delta DNO \cong \Delta BMO$ [By AAS]

$\therefore OD = OB$ [C.P.C.T]

So, AC bisects BD.

Question 6:



Given: ABCD is quadrilateral in which AB = AD and BC = DC

To Prove: (i) AC bisects ∠A and ∠C

(ii) BE = DE

(iii) ∠ABC = ∠ADC

Proof: In ΔABC and ΔADC, we have

AB=AD	[Given]
BC=DC	[Given]
AC=AC	[Common]

Thus by Side-Side-Side criterion of congruence,

ΔABC ≅ ΔADC .....(1)

The corresponding parts of the congruent triangles are equal.

So, ∠BAC =∠DAC [C.P.C.T]

⇒ ∠BAE =∠DAE

It means that AC bisects ∠BAD, that is ∠A

Also, ∠BCA=∠DCA [C.P.C.T]

⇒ ∠BCE=∠DCE

It means that AC bisects ∠BCD, that is ∠C

(ii) In ΔABE and ΔADE, we have

AB = AD	[given]
∠BAE = ∠DAE	[from (i)]
AE = AE	[Common]

Thus by Side-Angle-Side criterion of congruence, we have

∴ ΔABE ≅ ∠ADE [∵ By SAS]

So, BE = DE [By c.p.c.t]

(iii) Since from equation (1) in subpart (i), we have

ΔABC ≅ ΔADC,

Thus, by c.p.c.t, ∠ABC = ∠ADC

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