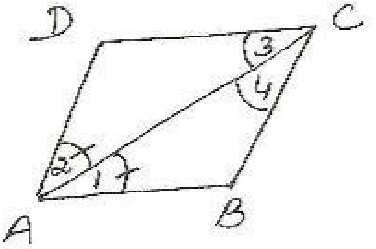
(6)

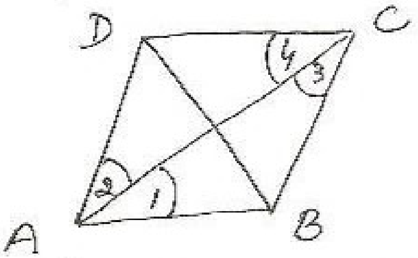


To Show – AC bisects ∠C
ABCD is a rhombus

Proof DC ∥ AB
∠3 = ∠1 ... (i) [al. in. ∠s]
AD ∥ BC
∠2 = ∠3 ... (ii) [al. in. ∠s]
∠1 = ∠2 ... (iii) (given)
From (i), (ii), (iii)
∠3 = ∠4

In △ABC and △ADC
∠1 = ∠2 (given)
AC = AC (common)
∠4 = ∠3 (Proved)
∴ △ABC ≅ △ADC by ASA prop.
AB = AD (cpct)
∴ ∥gm ABCD is a rhombus

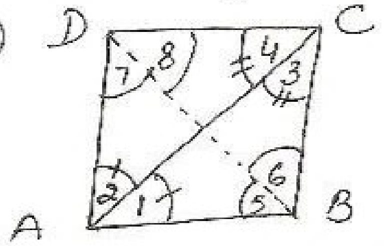
(7)



To Prove AC bisects ∠A, ∠C
BD bisects ∠B, ∠D

Proof – In △ABC and △ADC
AB = AD (Sides of rh.)
BC = DC
AC = AC (common)
∴ △ABC ≅ △ADC by SSS prop
∠1 = ∠2
∠3 = ∠4 (cpct)
∴ AC bisects ∠A, ∠C
Similarly ∠B, ∠D.

(8)



To Show – (i) rect. ABCD is a square
(ii) diagonal BD bisects ∠B, ∠D

Proof –
In △ABC and △ADC
∠1 = ∠2 (given)
AC = AC (common)
∠3 = ∠4 (given)
∴ △ABC ≅ △ADC by ASA prop
AB = AD (cpct)
rect. ABCD is a square.
In △ABD and △CBD
AB = CB (Sides of sq.)
BD = BD (common)
AD = CD (Sides of sq.)
∴ △ABD ≅ △CBD by SSS p
∠5 = ∠6, ∠7 = ∠8 (cpct)
⇒ BD bisects ∠B and ∠D