

NCERT Solutions by Dev Anoop (Bathinda) Ex 8.1

① let the angles be

$$3x^\circ, 5x^\circ, 9x^\circ, 13x^\circ$$

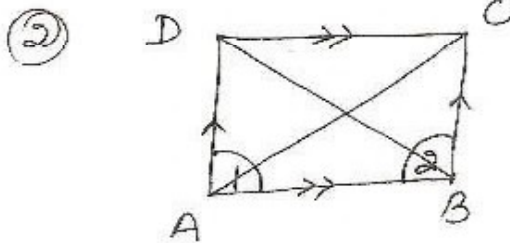
$$3x^\circ + 5x^\circ + 9x^\circ + 13x^\circ = 360^\circ$$

[angle sum prop. of \square]

$$\Rightarrow 30x^\circ = 360$$

$$\Rightarrow x = 12$$

$$\therefore \text{angles are } \begin{aligned} 3 \times 12 &= 36^\circ \\ 5 \times 12 &= 60^\circ \\ 9 \times 12 &= 108^\circ \\ 13 \times 12 &= 156^\circ \end{aligned}$$



To Prove $\parallel\text{gm } ABCD$ is a rect.

Proof In $\triangle DAB$ and $\triangle CBA$

$$DA = CB \text{ [opp. sides of } \parallel\text{gm]}$$

$$AB = BA \text{ [common]}$$

$$DB = CA \text{ [given]}$$

$$\therefore \triangle DAB \cong \triangle CBA \text{ by SSS prop.}$$

$$\angle 1 = \angle 2 \text{ (cpct)}$$

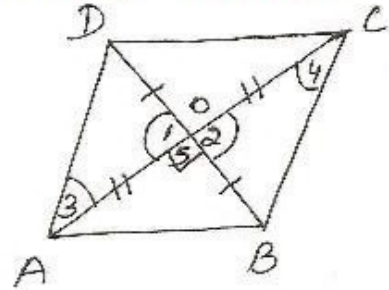
$$\text{But } \angle 1 + \angle 2 = 180^\circ \text{ (co. int. LS)}$$

$$2\angle 1 = 180$$

$$\Rightarrow \angle 1 = 90^\circ$$

$\therefore \parallel\text{gm } ABCD$ is a rect.

③



To Prove - $\square ABCD$ is a rhombus.

Proof In $\triangle AOD$ and $\triangle COB$
 $OD = OB$ [diag. bisect]
 $\angle 1 = \angle 2$ [vert. opp. \angle s]
 $OA = OC$ [diagonals bisect each other]

$$\therefore \triangle AOD \cong \triangle COB \text{ by SAS prop}$$

$$\angle 3 = \angle 4 \text{ (cpct)}$$

But these are alternate interior \angle s

$$\therefore AD \parallel BC$$

Similarly $DC \parallel AB$

$\square ABCD$ is a $\parallel\text{gm}$.

In $\triangle AOD$ and $\triangle AOB$

$$OA = OA \text{ (common)}$$

$$\angle 1 = \angle 5 = 90^\circ$$

$$OD = OB \text{ (given)}$$

$$\therefore \triangle AOD \cong \triangle AOB \text{ by SAS prop}$$

$$AD = AB \text{ (cpct)}$$

$\therefore \parallel\text{gm } ABCD$ is a rhombus

for alternate method see Q5