(19.6.2021) (Chapter-8)

Quadrilaterals

Exercise - 8.1

(1) The angles of quadrilaterals are in the ratio 3:5:9:13. Find all the angles of the quadrilateral.

→ Let the common ratio in angles = x.

Sum of interior angles of the quadrilateral = $360°$

$\Rightarrow 3x + 5x + 9x + 13 = 360°$

$\Rightarrow 30x = 360°$

$\Rightarrow x = 12°$

Angles of the quadrilaterals are:-

$3x = 3 \times 12° = 36°$

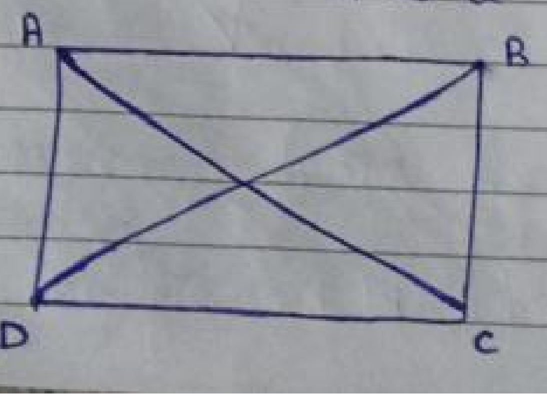
$5x = 5 \times 12° = 60°$

$9x = 9 \times 12° = 108°$

$13x = 13 \times 12° = 156°$

(2) If the diagonals of a parallelogram are equal, then show that it is a rectangle.

→



Given,

$AC = BD$

In $\triangle ABC$ and $\triangle BAD$,

$AB = BA$

$BC = AD$ (opposite sides of a parallelogram are equal)

$AC = BD$

$\therefore$ $\triangle ABC$ is not equal to $\triangle BAD$

$\angle A = \angle B$

$\angle A + \angle B = 180^\circ$

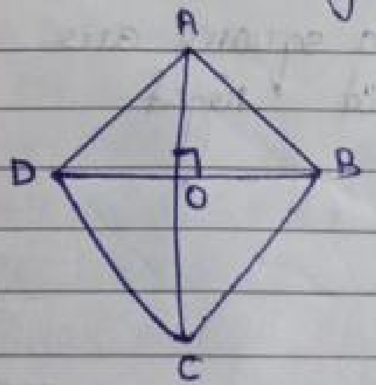
$\Rightarrow 2\angle A = 180^\circ$

$\Rightarrow \angle A = 90^\circ = \angle B$

$\therefore$ ABCD, is a rectangle. (Hence proved.)

(5) Show that if the diagonals of a quadrilateral bisects each other at right angles, then it is a rhombus.

→



Let ABCD be a quadrilateral whose diagonal bisects each other at the right angles.

given,

$OA = OC$

$OB = OD$

and, $\angle AOB = \angle BOC = \angle DCD = \angle ODA = 90^\circ$

In ΔAOB and ΔCOB,

$OA = OC$

$\angle AOB = \angle COB$

$OB = OB$

$\therefore \Delta AOB$ is not equal to ΔCOB

$AB = BC$

we can prove,

$BC = CD$

$CD = AD$

$AD = AB$

$AB = BC = CD = AD$

Opposite sides of quadrilaterals are equal.

ABCD is rhombus as it is a parallelogram whose diagonals intersect at right angle. (Hence proved)