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Chapter:- 8

Quadrilaterals

Exercise 8.1

1) Let the common ratio between the angles be x.

We know that the sum of the interior angles of the quadrilateral $= 360^\circ$

Now,

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

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

$$\Rightarrow x = 12^\circ$$

Angles of the quadrilateral are:

$3x = 3 \times 12^\circ = 36^\circ$

$5x = 5 \times 12^\circ = 60^\circ$

$9x = 9 \times 12^\circ = 108^\circ$

$13x = 13 \times 12^\circ = 156^\circ$

2) Given that,

$$AC = BD$$

To show that, ABCD is a rectangle if the diagonals of a parallelogram are equal.

To show ABCD is a rectangle we have to prove that one of its interior angles in right angled.

Proof,

In ΔABC and ΔBAD,

$AB = BA$ (Common)

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

$AC = BD$ (Given)

Therefore,

$\Delta ABC \cong \Delta BAD$ [SSS congruency]

$\angle A = \angle B$ [CPCT]

Also,

$\angle A + \angle B = 180^\circ$ (sum of the angles on the same side of the transversal)

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

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

Therefore,

ABCD is a rectangle.

Hence

Proved.