

## Exercise 14.1

**Question 1:** Three angles of a quadrilateral are respectively equal to  $110^\circ$ ,  $50^\circ$  and  $40^\circ$ . Find its fourth angle.

**Solution:**

Three angles of a quadrilateral are  $110^\circ$ ,  $50^\circ$  and  $40^\circ$

Let the fourth angle be 'x'

We know, sum of all angles of a quadrilateral =  $360^\circ$

$$110^\circ + 50^\circ + 40^\circ + x^\circ = 360^\circ$$

$$\Rightarrow x = 360^\circ - 200^\circ$$

$$\Rightarrow x = 160^\circ$$

Therefore, the required fourth angle is  $160^\circ$ .

**Question 2:** In a quadrilateral ABCD, the angles A, B, C and D are in the ratio of 1:2:4:5. Find the measure of each angles of the quadrilateral.

**Solution:**

Let the angles of the quadrilaterals are  $A = x$ ,  $B = 2x$ ,  $C = 4x$  and  $D = 5x$

We know, sum of all angles of a quadrilateral =  $360^\circ$

$$A + B + C + D = 360^\circ$$

$$x + 2x + 4x + 5x = 360^\circ$$

$$12x = 360^\circ$$

$$x = 360^\circ/12 = 30^\circ$$

Therefore,

$$A = x = 30^\circ$$

## Solutions for Class 9 Maths Chapter 14 Quadrilaterals

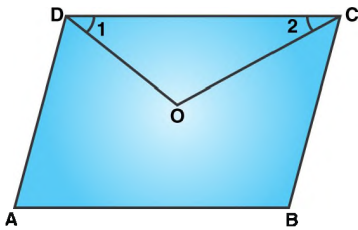
$$B = 2x = 60^\circ$$

$$C = 4x = 120^\circ$$

$$D = 5x = 150^\circ$$

**Question 3:** In a quadrilateral ABCD, CO and DO are the bisectors of  $\angle C$  and  $\angle D$  respectively. Prove that  $\angle COD = \frac{1}{2}(\angle A + \angle B)$ .

**Solution:**



In  $\triangle DOC$ ,

$$\angle CDO + \angle COD + \angle DCO = 180^\circ \quad [\text{Angle sum property of a triangle}]$$

$$\text{or } \frac{1}{2}\angle CDA + \angle COD + \frac{1}{2}\angle DCB = 180^\circ$$

$$\angle COD = 180^\circ - \frac{1}{2}(\angle CDA + \angle DCB) \quad \dots(i)$$

Also

We know, sum of all angles of a quadrilateral =  $360^\circ$

$$\angle CDA + \angle DCB = 360^\circ - (\angle DAB + \angle CBA) \quad \dots(ii)$$

Substituting (ii) in (i)

$$\angle COD = 180^\circ - \frac{1}{2}\{360^\circ - (\angle DAB + \angle CBA)\}$$

We can also write,  $\angle DAB = \angle A$  and  $\angle CBA = \angle B$

$$\angle COD = 180^\circ - 180^\circ + \frac{1}{2}(\angle A + \angle B)$$

$$\angle COD = \frac{1}{2}(\angle A + \angle B)$$

Hence Proved.

## Solutions for Class 9 Maths Chapter 14 Quadrilaterals

**Question 4:** The angles of a quadrilateral are in the ratio 3:5:9:13. Find all the angles of the quadrilateral.

**Solution:**

The angles of a quadrilateral are  $3x$ ,  $5x$ ,  $9x$  and  $13x$  respectively.

We know, sum of all interior angles of a quadrilateral =  $360^\circ$

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

$$30x = 360^\circ$$

$$\text{or } x = 12^\circ$$

Hence, angles measures are

$$3x = 3(12) = 36^\circ$$

$$5x = 5(12) = 60^\circ$$

$$9x = 9(12) = 108^\circ$$

$$13x = 13(12) = 156^\circ$$