

# CLASS 8 · HOTS · OLYMPIAD PREPARATION · SHORT NOTES

## Chapter 10: HOTS: Quadrilaterals (Class 8)

Topic-wise short notes with solved examples

Higher order thinking questions on quadrilaterals for Class 8: angles in a quadrilateral, parallelograms, rhombuses, rectangles, kites and their diagonals, each with a full solution.

### 1 Solved HOTS questions

- The angles of a quadrilateral add up to  $360^\circ$ . In a parallelogram opposite angles are equal and adjacent angles add up to  $180^\circ$ . The diagonals of a rectangle are equal; those of a rhombus bisect each other at right angles; the area of a rhombus or a kite is  $\frac{1}{2}d_1d_2$ .

**Example 1.1** The angles of a quadrilateral are in the ratio 3 : 4 : 5 : 6. Find them.

SOLUTION

Let the angles be  $3x$ ,  $4x$ ,  $5x$  and  $6x$ .  $18x = 360^\circ$ , so  $x = 20^\circ$ .

**$60^\circ$ ,  $80^\circ$ ,  $100^\circ$  and  $120^\circ$**

**Example 1.2** Two adjacent angles of a parallelogram are in the ratio 2 : 3. Find all its angles.

SOLUTION

Adjacent angles add up to  $180^\circ$ , so  $5x = 180^\circ$  and  $x = 36^\circ$ .

The angles are  $72^\circ$  and  $108^\circ$ , and the opposite angles repeat these.

**$72^\circ$ ,  $108^\circ$ ,  $72^\circ$ ,  $108^\circ$**

**Example 1.3** The diagonals of a rhombus are 10 cm and 24 cm. Find its side and area.

SOLUTION

The diagonals bisect each other at right angles, so a side is  $\sqrt{5^2 + 12^2} = 13$  cm.

Area =  $\frac{1}{2} \times 10 \times 24 = 120$ .

**Side 13 cm and area 120 square cm**

**Example 1.4** The sides of a rectangle are 8 cm and 15 cm. Find the length of its diagonal.

SOLUTION

$\sqrt{8^2 + 15^2} = \sqrt{289}$ .

**17 cm**

**Example 1.5** The diagonals of a kite are 12 cm and 16 cm. Find its area.

SOLUTION

$$\text{Area} = \frac{1}{2} \times 12 \times 16.$$

**96 square cm**

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