

CLASS 8 · HOTS · OLYMPIAD PREPARATION · SHORT NOTES

Chapter 12: HOTS: Area (Class 8)

Topic-wise short notes with solved examples

Higher order thinking questions on area for Class 8: parallelograms, triangles, trapeziums and rhombuses, paths around a garden and units of area, each with a full solution.

1 Solved HOTS questions

- Area formulas: rectangle $l \times b$; parallelogram base $\times$ height; triangle $\frac{1}{2} \times$ base $\times$ height; trapezium $\frac{1}{2}(a + b) \times h$; rhombus $\frac{1}{2}d_1d_2$. For a path of width w around a rectangle, find the area of the bigger rectangle and subtract the area of the smaller one. 1 hectare = 10 000 square metres.

Example 1.1 Find the area of a parallelogram with base 15 cm and height 8 cm.

SOLUTION

$$\text{Area} = 15 \times 8.$$

120 square cm

Example 1.2 Find the area of a trapezium whose parallel sides are 12 cm and 18 cm and whose height is 10 cm.

SOLUTION

$$\text{Area} = \frac{1}{2}(12 + 18) \times 10 = 15 \times 10.$$

150 square cm

Example 1.3 The area of a triangle is 84 square cm and its base is 14 cm. Find its height.

SOLUTION

$$\frac{1}{2} \times 14 \times h = 84, \text{ so } 7h = 84.$$

12 cm

Example 1.4 A path 2 m wide runs around the outside of a rectangular garden 30 m by 20 m. Find the area of the path.

SOLUTION

The outer rectangle is $(30 + 4) \times (20 + 4) = 34 \times 24 = 816$ square m.

The garden has area $30 \times 20 = 600$ square m.

The path is $816 - 600$.

216 square m

Example 1.5 A rhombus has a side of 10 cm and one diagonal of 12 cm. Find its area.

SOLUTION

Half of the given diagonal is 6 cm. Half of the other diagonal $= \sqrt{10^2 - 6^2} = 8$ cm, so the other diagonal is 16 cm.

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

96 square cm