

Mathematics

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(Chapter – 12) (Heron's Formula)(Exemplar Problems)

(Class – IX)

Exercise 12.2

Write **True** or **False** and justify your answer:

Question 5:

If the side of a rhombus is 10 cm and one diagonal is 16 cm, the area of the rhombus is 96 cm^2

Answer 5:

True

Given, side of a rhombus PQRS is 10cm and one of the diagonal is 16 cm.

i.e., $PQ = QR = RS = SP = 10\text{cm}$ and one of the diagonal is 16cm.

In ΔPOQ , $PQ^2 = OP^2 + OQ^2$ [By Pythagoras theorem]

[Since, the diagonal of rhombus bisects each other at 90°]

$$\Rightarrow OQ^2 = PQ^2 - OP^2 = 10^2 - 8^2$$

$$\Rightarrow OQ^2 = 100 - 64 = 36$$

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$$\Rightarrow OQ = 6 \text{ cm}$$

[Taking positive square root because length is always positive]

$$\therefore SQ = 2OP = 2 \times 6 = 12\text{cm}$$

$$\therefore \text{Area of a rhombus} = \frac{1}{2} (\text{Product of diagonals})$$

$$= \frac{1}{2} (QS \times PR) = \frac{1}{2} \times 12 \times 16 = 96 \text{ cm}^2$$

