



Exercise 5D

Q15

Answer :

Suppose the sides are x and y of lengths 16 cm and 12 cm, respectively.

Let the diagonal be z cm.

Clearly, the diagonal is the hypotenuse of the right triangle with legs x and y .

By Pythagoras theorem:

$$z^2 = x^2 + y^2$$

$$\Rightarrow z^2 = 16^2 + 12^2$$

$$\Rightarrow z^2 = 256 + 144$$

$$\Rightarrow z^2 = 400$$

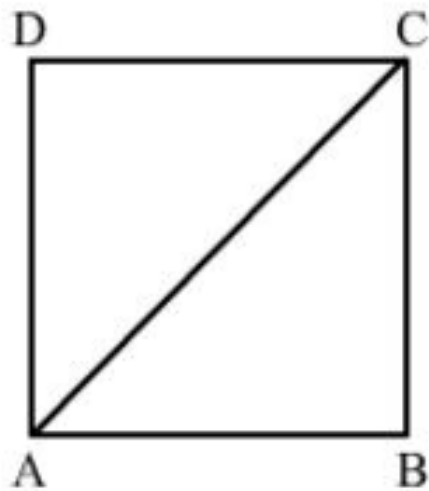
$$\Rightarrow z^2 = 20^2$$

$$\Rightarrow z = 20$$

Hence, the length of the diagonal is 20 cm.

Q16

Answer :



AB = 40 cm

Diagonal, AC = 41 cm

Then, by Pythagoras theorem in right $\triangle ABC$:

$$AC^2 = AB^2 + BC^2$$

$$\Rightarrow BC^2 = 41^2 - 40^2$$

$$\Rightarrow BC^2 = 1681 - 1600$$

$$\Rightarrow BC^2 = 81$$

$$\Rightarrow BC^2 = 9^2$$

$$\Rightarrow BC = 9 \text{ cm}$$

$$\therefore \text{Length} = 40 \text{ cm}$$

$$\text{Breadth} = 9 \text{ cm}$$

$$\begin{aligned}\therefore \text{Perimeter of the rectangle} &= 2(\text{length} + \text{breadth}) \\ &= 2(40+9) \\ &= 98 \text{ cm}\end{aligned}$$

Q17

Answer :

We know that the diagonals of a rhombus bisect each other at right angles.

Therefore, in right triangle AOB, we have:

$$AO = 8 \text{ cm}$$

$$BO = 15 \text{ cm}$$

By Pythagoras theorem in $\triangle AOB$:

$$AB^2 = AO^2 + BO^2$$

$$\Rightarrow AB^2 = 8^2 + 15^2$$

$$\Rightarrow AB^2 = 64 + 225$$

$$\Rightarrow AB^2 = 289$$

$$\Rightarrow AB^2 = 17^2$$

$$\Rightarrow AB = 17 \text{ cm}$$

Now, as we know that all sides of a rhombus are equal.

$$\begin{aligned}\therefore \text{Perimeter of the rhombus} &= 4(\text{side}) \\ &= 4(17) \\ &= 68 \text{ cm}\end{aligned}$$

Q18

Answer :

(i) In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

(ii) If the square of one side of a triangle is equal to the sum of the squares of the other two sides then the triangle is right angled.

(iii) Of all the line segments that can be drawn to a given line from a given point outside it, the perpendicular is the shortest.

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