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*.

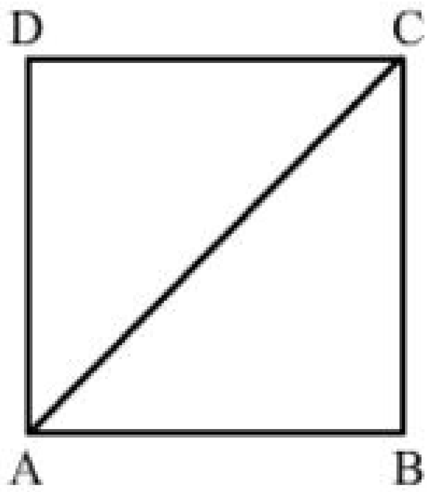
By Pythagoras theorem:

$$z^2 = x^2 + y^2$$
$$\Rightarrow z^2 = 16^2 + 12^2$$
$$\Rightarrow z^2 = 256 + 144$$
$$\Rightarrow z^2 = 400$$
$$\Rightarrow z^2 = 20^2$$
$$\Rightarrow z = 20$$

Hence, the length of the diagonal is 20 cm.

Q16

Answer :



AB = 40 cm

Diagonal, AC = 41 cm

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

$$\mathrm{AC}^2 = \mathrm{AB}^2 + \mathrm{BC}^2$$
$$\Rightarrow \mathrm{BC}^2 = 41^2 - 40^2$$
$$\Rightarrow \mathrm{BC}^2 = 1681 - 1600$$
$$\Rightarrow \mathrm{BC}^2 = 81$$
$$\Rightarrow \mathrm{BC}^2 = 9^2$$
$$\Rightarrow \mathrm{BC} = 9 \text{ cm}$$

∴ Length = 40 cm
Breadth = 9 cm

∴ Perimeter of the rectangle = 2(length + breadth)
= 2(40+9)
= 98 cm

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 cm
BO = 15 cm

By Pythagoras theorem in ∆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.
∴ Perimeter of the rhombus = 4(side)
= 4(17)
= 68 cm

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 s 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.

*********** END **********