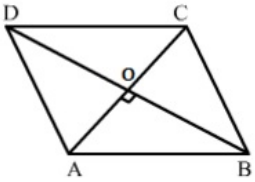
Exercise 16A

Q10

Answer :



Let $ABCD$ be a rhombus.
Let AC and BD be the diagonals of the rhombus intersecting at a point O.
Let $AC = 16$ cm
BD $= 12$ cm
We know that the diagonals of a rhombus bisect each other at right angles.

$$\therefore AO = \frac{1}{2}AC$$
$$= \left(\frac{1}{2} \times 16\right) \text{ cm}$$
$$= 8 \text{ cm}$$
$$BO = \frac{1}{2}BD$$
$$= \left(\frac{1}{2} \times 12\right) \text{ cm}$$
$$= 6 \text{ cm}$$

From the right ΔAOB :

$$AB^2 = AO^2 + BO^2$$
$$= \left\{(8)^2 + (6)^2\right\} \text{ cm}^2$$
$$= (64 + 36) \text{ cm}^2$$
$$= 100 \text{ cm}^2$$
$$\Rightarrow AB = \sqrt{100} \text{ cm}$$
$$= 10 \text{ cm}$$

Hence, the length of the side AB *is* 10 cm.

$$AB = BC = CD = DA = 10 \text{ cm} \qquad \left(\text{all sides of a rhombus are equal}\right)$$

Q11

Answer :

Refer to the figure given in the book.

In $\triangle ADC$:

$DA = DC$ (all sides of a square are equal)

$\Rightarrow \angle ACD = \angle CAD$

Let $\angle ACD = \angle CAD = x^\circ$ [Angle opposite to the equal sides are equal]

$x + x + 90 = 180$ [since the sum of the angles of a triangle is 180°]

$\Rightarrow 2x + 90 = 180$

$\Rightarrow 2x = 90$

$\Rightarrow x = \frac{90}{2}$

$\Rightarrow x = 45$

$\therefore \angle CAD = 45^\circ$

Q12

Answer:

Let the length of two sides of the rectangle be $5x$ cm and $4x$ cm, respectively.

Then, its perimeter $= 2(5x + 4x)$ cm

$= 18x$ cm

$\therefore 18x = 90$

$\Rightarrow x = \frac{90}{18}$

$\Rightarrow x = 5$

Length of one side $\Rightarrow (5 \times 5)$ cm $= 25$ cm

Length of the other side $\Rightarrow (4 \times 5)$ cm $= 20$ cm

$\therefore$ Length of the rectangle $= 25$ cm

Breadth $= 20$ cm

Q13

Answer:

(i) The diagonals are equal and the adjacent sides are unequal.
Hence, the given parallelogram is a rectangle.

(ii) The diagonals are equal and the adjacent sides are equal.
Hence, the given parallelogram is a square.

(iii) The diagonals are unequal and the adjacent sides are equal.
Hence, the given parallelogram is a rhombus.

(iv) All the sides are equal and one angle is 60°.
Hence, the given parallelogram is a rhombus.

(v) All the sides are equal and one angle is 90°.
Hence, the given parallelogram is a square.

(vi) All the angles are equal and the adjacent sides are unequal.
Hence, the given parallelogram is a rectangle.

Q14

Answer:

(i) The given statement is false.
The diagonals of a parallelogram bisect each other, but they are not equal in length.

(ii) The given statement is false.
The diagonals of a rectangle are equal and bisect each other, but they are not perpendicular.

(iii) The given statement is false.
All the sides of a rhombus are equal, but the diagonals are not equal.

(iv) The given statement is true.

(v) The given statement is false.
Every square is a rectangle, but every rectangle is not a square.

(vi) The given statement is true.

(vii) The given statement is true.

(viii) The given statement is true.

(ix) The given statement is false.
A rectangle is a special type of parallelogram, but every parallelogram is not a rectangle.

(x) The given statement is true.

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