



Areas of Parallelograms and Triangles Ex 15.3 Q5

**Answer :**

**Given:** Here from the given figure we get

- (1) ABCD is a trapezium
- (2)  $AB = 7$  cm,
- (3)  $AD = BC = 5$  cm,
- (4)  $DC = x$  cm
- (5) Distance between AB and DC is 4 cm

**To find:**

- (a) The value of  $x$
- (b) Area of trapezium

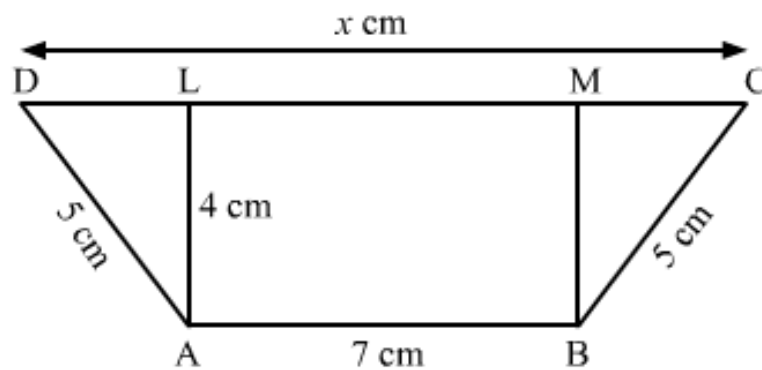
**Construction:** Draw  $AL \perp CD$ , and  $BM \perp CD$

**Calculation:**

Since  $AL \perp CD$ , and  $BM \perp CD$

Since distance between AB and CD is 4 cm. So

$AL = BM = 4$  cm, and  $LM = 7$  cm



In triangle ADL use Pythagoras Theorem

$$AD^2 = AL^2 + DL^2$$

$$\Rightarrow 5^2 = DL^2 + 4^2$$

$$\Rightarrow DL^2 = 5^2 - 4^2$$

$$\Rightarrow DL^2 = 25 - 16$$

$$\Rightarrow DL^2 = 9$$

$$\Rightarrow DL = 3 \text{ cm}$$

Similarly in right triangle BMC use Pythagoras Theorem

$$BC^2 = BM^2 + MC^2$$

$$\Rightarrow 5^2 = 4^2 + MC^2$$

$$\Rightarrow MC^2 = 5^2 - 4^2$$

$$\Rightarrow MC^2 = 25 - 16$$

$$\Rightarrow MC^2 = 9$$

$$\Rightarrow MC = 3 \text{ cm}$$

Now

$$x = CD$$

$$= CM + ML + LD$$

$$= 3 + 7 + 3$$

$$= 13 \text{ cm}$$

We know that,

$$\text{Area of a trapezium} = \frac{1}{2} \times \text{sum of the parallel sides} \times \text{height}$$

$$\text{Area of a trapezium} = \frac{1}{2} \times (AB + CD) \times AL$$

$$= \frac{1}{2} \times (7 + 13) \times 4$$

$$= \frac{1}{2} \times (20) \times 4$$

$$= 2 \times 20$$

$$= 40 \text{ cm}^2$$

We get the result as  $x = 13 \text{ cm}$

Area of trapezium is  $= 40 \text{ cm}^2$

**Answer :**

**Given:** Here from the given figure we get

(1) OCDE is a rectangle inscribed in a quadrant of a circle with radius 10cm,

(2)  $OE = 2\sqrt{5}\text{cm}$

**To find:** Area of rectangle OCDE.

**Calculation:**

In right triangle  $\triangle ODE$  use Pythagoras Theorem

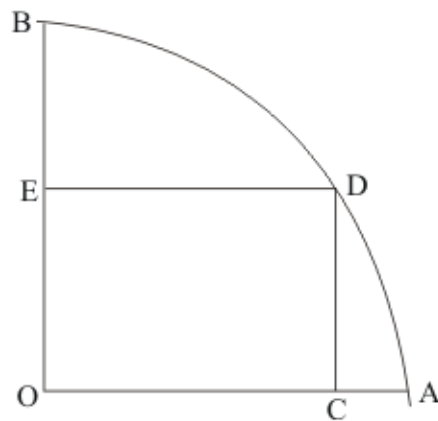
$$OD^2 = OE^2 + ED^2$$

$$\Rightarrow 10^2 = (2\sqrt{5})^2 + ED^2$$

$$\Rightarrow ED^2 = 100 - 20$$

$$\Rightarrow ED = \sqrt{80}$$

$$\Rightarrow ED = 4\sqrt{5}\text{ cm}$$



We know that,

$$\begin{aligned}\text{Area}(\square OCDE) &= \text{base} \times \text{height} \\ &= OE \times ED \\ &= 2\sqrt{5} \times 4\sqrt{5} \\ &= 40\text{ cm}^2\end{aligned}$$

Hence we get the result as area of Rectangle OCDE =  $\boxed{40\text{ cm}^2}$

\*\*\*\*\* END \*\*\*\*\*