



Areas of Parallelograms and Triangles Ex 15.3 Q3

Answer :

Given:

(1) PQRS is a trapezium in which $SR \parallel PQ$.

(2) $PT = 5$ cm.

(3) $QT = 8$ cm.

(4) $RQ = 17$ cm.

To Calculate: Area of trapezium PQRS.

Calculation:

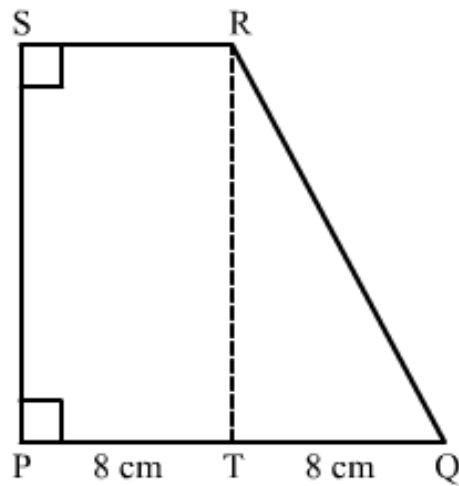
In triangle

$$RQ^2 = TQ^2 + RT^2$$

$$17^2 = 8^2 + RT^2$$

$$\begin{aligned} RT^2 &= 17^2 - 8^2 \\ &= 289 - 64 \\ &= 225 \end{aligned}$$

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



∴ We know that Area of a triangle = $\frac{1}{2}$ base \times height .So

$$\begin{aligned}\text{Area of } \triangle QTR &= \frac{1}{2} \text{ base} \times \text{height} \\ &= \frac{1}{2} (8 \times 15) \\ &= \frac{1}{2} (120) \\ &= 60 \text{ cm}^2\end{aligned}$$

No area of rectangle PTRS

$$\begin{aligned}\text{Area}(\square \text{PTRS}) &= \text{base} \times \text{height} \\ &= 8 \times 15 \\ &= 120 \text{ cm}^2\end{aligned}$$

Therefore area of trapezium PQRS is

$$\begin{aligned}&= \text{Area}(\triangle QRT) + \text{Area}(\text{PTRS}) \\ &= 60 + 120 \\ &= 180 \text{ cm}^2\end{aligned}$$

Hence the answer is Area of a trapezium PQRS = 180 cm²

Areas of Parallelograms and Triangles Ex 15.3 Q4

Answer :

Given: In figure:

- (1) $\angle AOB = 90^\circ$
- (2) $AC = BC$,
- (3) $OA = 12 \text{ cm}$,
- (4) $OC = 6.5 \text{ cm}$.

To find: Area of $\triangle AOB$

Calculation:

It is given that $AC = BC$ where C is the mid point of AB

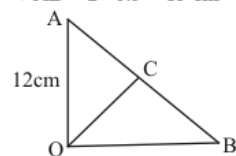
We know that the mid point of hypotenuse of right triangle is equidistant from the vertices

Therefore

$$CA = BC = OC$$

$$\Rightarrow CA = BC = 6.5$$

$$\Rightarrow AB = 2 \cdot 6.5 = 13 \text{ cm}$$



Now in triangle OAB use Pythagoras Theorem

$$AB^2 = OB^2 + OA^2$$

$$13^2 = OB^2 + 12^2$$

$$OB^2 = 13^2 - 12^2$$

$$OB^2 = 169 - 144$$

$$OB^2 = 25$$

$$OB = 5 \text{ cm}$$

So area of triangle OAB

$$= \frac{1}{2} \times \text{base} \times \text{height}$$

$$= \frac{1}{2} \times 12 \times 5$$

$$= \frac{1}{2} \times 60$$

$$30 \text{ cm}^2$$

Hence area of triangle is $\Delta AOB = 30 \text{ cm}^2$

***** END *****