



Areas of Parallelograms and Triangles Ex 15.3 Q1

Answer :

Given: Here from the given figure we get

(1) ABCD is a quadrilateral with base AB,

(2) $\triangle ABD$ is a right angled triangle

(3) $\triangle BCD$ is a right angled triangle with base BC right angled at B

To Find: Area of quadrilateral ABCD

Calculation:

In right triangle $\triangle BCD$, by using Pythagoreans theorem

$$CD^2 = BD^2 + BC^2$$

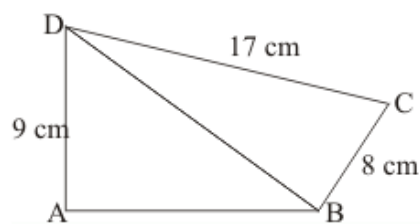
$$\Rightarrow 17^2 = BD^2 + 8^2$$

$$\Rightarrow BD^2 = 17^2 - 8^2$$

$$\Rightarrow BD^2 = 289 - 64$$

$$\Rightarrow BD^2 = 225$$

$$\Rightarrow BD = 15 \text{ cm}$$



since area of triangle $= \frac{1}{2} \text{ base} \times \text{height}$.So

$$\begin{aligned}\text{Area of right triangle } \triangle BCD &= \frac{1}{2} \times BC \times BD \\ &= \frac{1}{2} \times 8 \times 15 \\ &= 60 \text{ cm}^2\end{aligned}$$

In right triangle ABD

$$BD^2 = AB^2 + AD^2$$

$$15^2 = AB^2 + 9^2$$

$$AB = \sqrt{225 - 81}$$

$$= \sqrt{144}$$

$$= 12 \text{ cm}$$

$$\begin{aligned}\text{Area of right triangle } \triangle ABD &= \frac{1}{2} \times AB \times AD \\ &= \frac{1}{2} \times 12 \times 9 \\ &= 54 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{Area of } \square ABCD &= \text{area}(\triangle ABD) + \text{area}(\triangle BCD) \\ &= 54 + 60 \\ &= 114 \text{ cm}^2\end{aligned}$$

Hence we get Area of quadrilateral ABCD = 114 cm^2

Areas of Parallelograms and Triangles Ex 15.3 Q2

Answer :

Given: Here from the given figure we get

(1) PQRS is a square,

(2) T is the midpoint of PS which means $TS = \frac{1}{2}PS$

(3) U is the midpoint of PS which means $QU = \frac{1}{2}QR$

(4) $QU = 8 \text{ cm}$

To find: Area of $\triangle OTS$

Calculation:

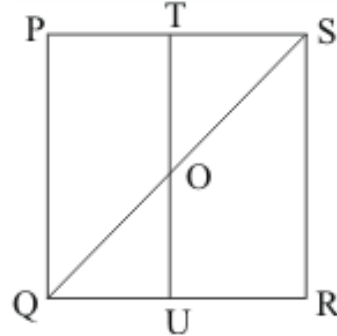
Since it is given that $PQ = 8 \text{ cm}$. So

$PS = SR = QR = 8 \text{ cm}$ (side of square are equal)

$$TS = \frac{1}{2}SR$$

$$= \frac{1}{2}(8)$$

$$TS = 4 \text{ cm}$$



Since T and U are the mid points of PS and QR respectively. So

$$TO = \frac{1}{2}PQ$$

$$= \frac{1}{2} \times 8$$

$$= 4 \text{ cm}$$

Therefore area of triangle OTS is equals to

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

$$= \frac{1}{2} \times 4 \times 4$$

$$= 8 \text{ cm}^2$$

Hence we get the result that Area of triangle OTS is 8 cm^2

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