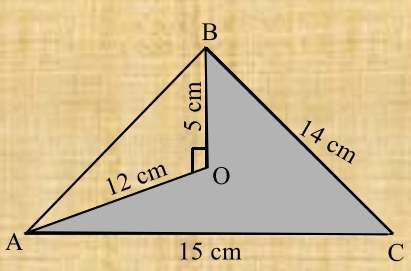
Brainbox learn easy

Chapter 12

HERON'S FORMULA

Example-3:

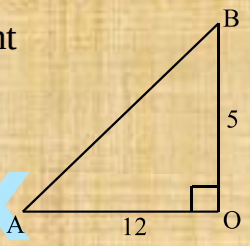
Calculate the area of the shaded region.



Solution:

Area of (Right angle) $\Delta AOB = \frac{1}{2} \times \text{Base} \times \text{height}$

$$= \frac{1}{2} \times 12^{6} \times 5$$



Area of (Right angle) $\Delta AOB = 30\ \text{cm}^2$.

Now, By pythagoras Theorem,

$$AB^2 = AO^2 + OB^2$$

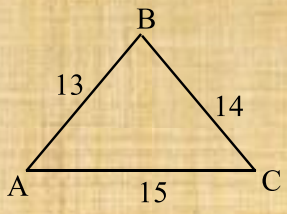
$$= 12^2 + 5^2$$

$$AB^2 = 144 + 25 = 169$$

$$AB = \sqrt{169} = 13\ \text{cm}$$

Now, $\Delta ABC \Rightarrow$ a =14 cm , b =15 cm , c =13 cm

$$S = \frac{a+b+c}{2} = \frac{14+15+13}{2} = \frac{42}{2} = 21\ \text{cm}$$



Area of $\Delta ABC = \sqrt{S(S-a)(S-b)(S-c)}$

Area of $\Delta ABC = \sqrt{21(21-14)(21-15)(21-13)}$

$$= \sqrt{21(7)(6)(8)}$$

$$= \sqrt{7 \times 3 \times 7 \times 3 \times 2 \times 4 \times 2}$$

$$= 7 \times 3 \times 2 \times 2$$

$$= 84\ \text{cm}^2$$

Area of shaded region = (Area of ΔABC) – (Area of ΔAOB)

$$= 84 - 30$$

$\therefore$ Required Area $= 54\ \text{cm}^2$.