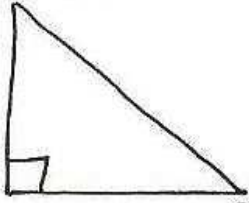


NCERT Exemplar Solutions by Dev Anoop (Bathinda), Ex. 7.3

(17)

A(2,9)



B(a,5) C(5,5)

$$\begin{aligned} AB^2 &= (a-2)^2 + (5-9)^2 \\ &= a^2 + 4 - 4a + 16 \\ &= a^2 - 4a + 20 \end{aligned}$$

$$\begin{aligned} BC^2 &= (5-a)^2 + (5-5)^2 \\ &= 25 + a^2 - 10a + 0 \\ &= a^2 - 10a + 25 \end{aligned}$$

$$\begin{aligned} CA^2 &= (2-5)^2 + (9-5)^2 \\ &= 9 + 16 \\ &= 25 \end{aligned}$$

\therefore ABC is a right Δ

$$\therefore CA^2 = AB^2 + BC^2$$

$$25 = a^2 - 4a + 20 + a^2 - 10a + 25$$

$$\Rightarrow 2a^2 - 14a + 20 = 0$$

$$\Rightarrow a^2 - 7a + 10 = 0$$

$$\Rightarrow (a-5)(a-2) = 0$$

$$\Rightarrow a = 5, a = 2$$

$a = 5$ rejected

\therefore B, C coincide

ar (ΔABC)

$$= \frac{1}{2} \begin{vmatrix} 2 & 9 \\ 2 & 5 \\ 5 & 5 \\ 2 & 9 \end{vmatrix}$$

$$= \frac{1}{2} |16 - 18 + 10 - 25 + 45 - 16|$$

$$= \frac{1}{2} |55 - 43|$$

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

$$= 6 \text{ sq. units}$$