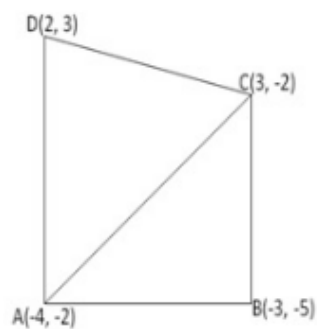




Exercise 16C

Question 2:

(i) Join A and C, then area of quad. ABCD = area of ΔABC + area of ΔACD

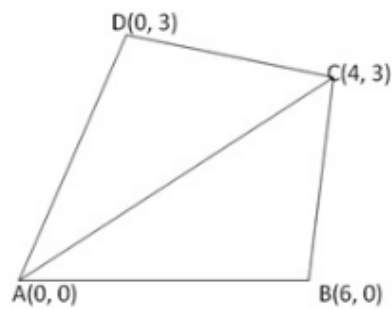


$$\begin{aligned}\text{Area of } \Delta ABC &= \frac{1}{2} [(-4)(-5+2) + (-3)(-2+2) + 3(-2+5)] \\ &= \frac{1}{2} (12 + 0 + 9) = \frac{21}{2} \text{ sq. unit}\end{aligned}$$

$$\begin{aligned}\text{Area of } \Delta ACD &= \frac{1}{2} [(-4)(-2-3) + 3(3+2) + 2(-2+2)] \\ &= \frac{1}{2} [20 + 15 + 0] = \frac{35}{2} \text{ sq. unit}\end{aligned}$$

$$\begin{aligned}\text{Area of quad. ABCD} &= (\text{area of } \Delta ABC) + (\text{area of } \Delta ACD) \\ &= \left(\frac{21}{2} + \frac{35}{2} \right) \text{ sq. units} = \frac{56}{2} \text{ sq. units} \\ &= 28 \text{ sq. units}\end{aligned}$$

(ii) The vertices of quad. ABCD are A(0, 0), B(6, 0), C(4, 3) and D(0, 3)



$$\text{Area of } \triangle ABC = \frac{1}{2} [x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$$

when the vertices are $A(x_1, y_1)$, $B(x_2, y_2)$, $C(x_3, y_3)$

$$= \frac{1}{2} [0 \times (0 - 3) + 6 \times (3 - 0) + 4(0 - 0)]$$

$$= \frac{1}{2} [0 + 18 + 0] = 9 \text{ sq. units}$$

$$\text{Area of } \triangle ACD = \frac{1}{2} [x_1(y_3 - y_4) + x_3(y_4 - y_1) + x_4(y_1 - y_3)]$$

when the vertices are $A(x_1, y_2)$, $C(x_3, y_3)$, $D(x_4, y_4)$

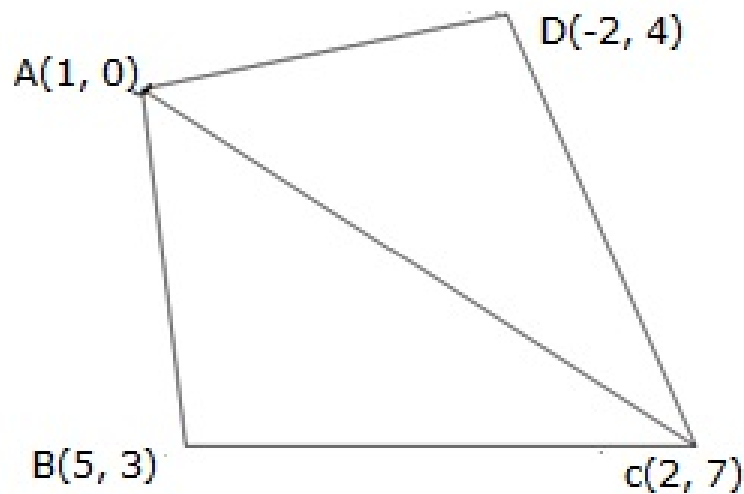
$$= \frac{1}{2} [0 \times (3 - 3) + 4 \times (3 - 0) + 0 \times (0 - 3)]$$

$$= \frac{1}{2} (0 + 12 + 0) = 6$$

Area of quad. ABCD = Area of $\triangle ABC$ + Area of $\triangle ACD$

$$= 9 + 6 = 15 \text{ sq. unit}$$

(iii) Vertices of quad. ABCD are $A(1, 0)$, $B(5, 3)$, $C(2, 7)$ and $D(-2, 4)$



Vertices of $\triangle ABC$ are $A(1, 0)$, $B(5, 3)$, $C(2, 7)$

Area of $\triangle ABC$

$$= \frac{1}{2} [x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$$

$$= \frac{1}{2} [1 \times (3 - 7) + 5 \times (7 - 0) + 2(0 - 3)]$$

$$= \frac{1}{2} [-4 + 35 - 6] = \frac{25}{2}$$

Vertices of $\triangle ACD$ are $A(1, 0)$, $C(2, 7)$ and $D(-2, 4)$

$$\text{Area of } \triangle ACD = \frac{1}{2} [1 \times (7 - 4) + 2 \times (4 - 0) + (-2) \times (0 - 7)]$$

$$= \frac{1}{2} [3 + 8 + 14] = \frac{25}{2}$$

Area of quadrilateral ABCD

= Area of $\triangle ABC$ + Area of $\triangle ACD$

$$= \frac{25}{2} + \frac{25}{2} = 25 \text{ sq.units}$$

***** END *****