Exercise 16A

Question 18:

Let O(0,0), A(3,√3) and B(3,-√3) are the given points.

$$\therefore\ OA = \sqrt{(3-0)^2 + \left(\sqrt{3}-0\right)^2} = \sqrt{9+3} = \sqrt{12}$$
$$= 2\sqrt{3} \text{ units}$$

$$AB = \sqrt{(3-3)^2 + \left(-\sqrt{3}-\sqrt{3}\right)^2} = \sqrt{0^2 + \left(-2\sqrt{3}\right)^2} = \sqrt{12}$$
$$= 2\sqrt{3} \text{ units}$$

$$OB = \sqrt{(3-0)^2 + \left(-\sqrt{3}-0\right)^2} = \sqrt{(3)^2 + \left(-\sqrt{3}\right)^2} = \sqrt{9+3} = \sqrt{12}$$
$$= 2\sqrt{3} \text{ units}$$

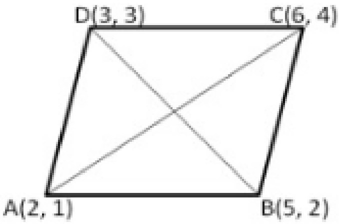
$$\therefore\ OA = AB = OB = 2\sqrt{3} \text{ units}$$

Hence, DABC is equilateral and each of its sides being 2√3 units.

$$\text{Area of } \Delta ABC = \left[\frac{\sqrt{3}}{4} \times (\text{side})^2\right] \text{sq.unit} = \times\left[\frac{\sqrt{3}}{4} \times \left(2\sqrt{3}\right)^2\right] \text{sq.unit}$$
$$= \left[\frac{\sqrt{3}}{4} \times 4 \times 3\right] \text{sq.unit} = 3\sqrt{3} \text{ sq.unit}$$

Question 19:

Let A(2,1), B(5,2), C(6,4) and D(3,3) are the angular points of a parallelogram ABCD. Then



$$AB = \sqrt{(5-2)^2 + (2-1)^2}$$
$$= \sqrt{(3)^2 + (1)^2}$$
$$= \sqrt{10} = \sqrt{10} \text{ units}$$
$$BC = \sqrt{(6-5)^2 + (4-2)^2}$$
$$= \sqrt{(1)^2 + (2)^2}$$
$$= \sqrt{1+4} = \sqrt{5} \text{ units}$$
$$DC = \sqrt{(6-3)^2 + (4-3)^2} = \sqrt{(3)^2 + (1)^2} = \sqrt{9+1} = \sqrt{10} \text{ units}$$
$$AD = \sqrt{(3-2)^2 + (3-1)^2} = \sqrt{(1)^2 + (2)^2} = \sqrt{1+4} = \sqrt{5} \text{ units}$$

Thus, $AB = DC$ and $AD = BC$

$$\text{Diagonal } AC = \sqrt{(6-2)^2 + (4-1)^2} = \sqrt{(4)^2 + (3)^2} = \sqrt{16+9}$$
$$= \sqrt{25} = 5 \text{ units}$$
$$\text{Diagonal } BD = \sqrt{(3-5)^2 + (3-2)^2} = \sqrt{(2)^2 + (1)^2} = \sqrt{5} \text{ unit}$$

Diagonal AC ≠ Diagonal BD.
Thus ABCD is not a rectangle but it is a parallelogram because its opposite sides are equal and diagonals are not equal.

*********** END **********