RD SHARMA

Solutions

Class 10 Maths

Chapter 14

Ex *14.1*

1. On which axis do the following points lie?

    (i)   P(5, 0)
    (ii)   Q(0 – 2)
    (iii)   R(−4, 0)
    (iv)   S(0, 5)

   **Sol:**

    (i) $P(5,0)$ lies on $x-axis$

    (ii) $Q(0,-2)$ lies on $y-axis$

    (iii) $R(-4,0)$ lies on $x-axis$

    (iv) $S(0,5)$ lies on $y-axis$

2. Let ABCD be a square of side 2a. Find the coordinates of the vertices of this square when
   (i) A coincides with the origin and AB and AB and coordinate axes are parallel to the sides AB and AD respectively.
   (ii) The center of the square is at the origin and coordinate axes are parallel to the sides AB and AD respectively.
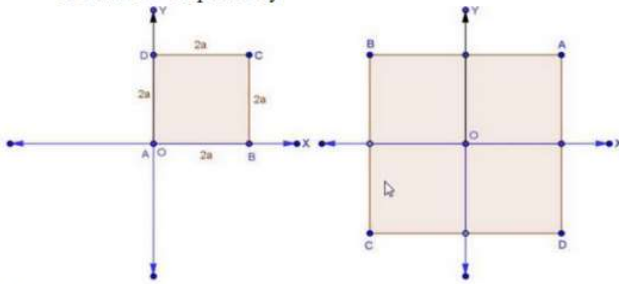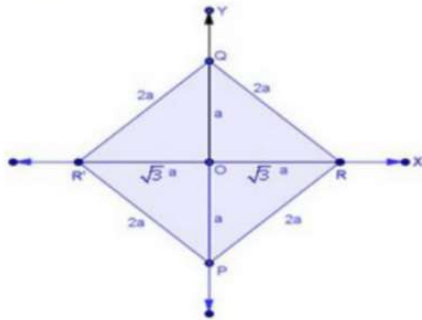

Sol:

(i) Coordinate of the vertices of the square of side $2a$ are:

$A(0,0), B(2a,0), C(2a,2a) \text{ and } D(0,2a)$

(ii) Coordinate of the vertices of the square of side $2a$ are:

$A(a,a), B(-a,a), C(-a,-a) \text{ and } (a,-a)$

3. The base PQ of two equilateral triangles PQR and PQR' with side 2a lies along y-axis such that the mid-point of PQ is at the origin. Find the coordinates of the vertices R and R' of the triangles.

Sol:

We have two equilateral triangle PQR and PQR' with side $2a$.

O is the mid-point of PQ.

In $\triangle QOR, \angle QOR = 90°$

Hence, by Pythagoras theorem

$OR^2 + OQ^2 = QR^2$

$$OR^2 = (2a)^2 - (a)^2$$
$$OR^2 = 3a^2$$
$$OR = \sqrt{(3)}a$$

Coordinates of vertex R is $\left(\sqrt{3}a, 0\right)$ and coordinate of vertex R' is $\left(-\sqrt{3}a, 0\right)$