

## Exercise 12.1

Page: 271

1.

A point is on the  $x$ -axis. What are its  $y$ -coordinate and  $z$ -coordinates

**Solution:**

The  $y$  and  $z$  coordinates of a point lying on the  $x$ -axis is 0.

2.

A point is in the  $XZ$ -plane. What can you say about its  $y$ -coordinate?

**Solution:**

The  $y$ -coordinates of a point lying in the  $XZ$ -plane is 0.

3.

Name the octants in which the following points lie:

$(1, 2, 3)$ ,  $(4, -2, 3)$ ,  $(4, -2, -5)$ ,  $(4, 2, -5)$ ,  $(-4, 2, -5)$ ,  $(-4, 2, 5)$ ,  
 $(-3, -1, 6)$   $(-2, -4, -7)$ .

**Solution:**

|                |        |
|----------------|--------|
| $(1, 2, 3)$    | - I    |
| $(4, -2, 3)$   | - IV   |
| $(4, -2, -5)$  | - VIII |
| $(4, 2, -5)$   | - V    |
| $(-4, 2, -5)$  | - VI   |
| $(-4, 2, 5)$   | - II   |
| $(-3, -1, 6)$  | - III  |
| $(-2, -4, -7)$ | - VII  |

4.

Fill in the blanks:

- (i) The  $x$ -axis and  $y$ -axis taken together determine a plane known as \_\_\_\_\_.
- (ii) The coordinates of points in the  $XY$ -plane are of the form \_\_\_\_\_.
- (iii) Coordinate planes divide the space into \_\_\_\_\_ octants.

**Solution:**

- (i) The  $x$ -axis and  $y$ -axis taken together determine a plane known as **XY-plane**
- (ii) The coordinates of points in the  $XY$ -plane are of the form  **$(x, y, 0)$** .
- (iii) Coordinate planes divide the space into **eight** octants.