Chapter -3

Coordinate Geometry

It is a branch of geometry which sets up a definite correspondence between the position of a point in a plane and a pair of algebraic numbers called co-ordinate.

Axes of Co-ordinate:-

In the figure, OX and OY are called x-axis and y-axis respectively. and both together are known as axes of coordinates.

Origin:-

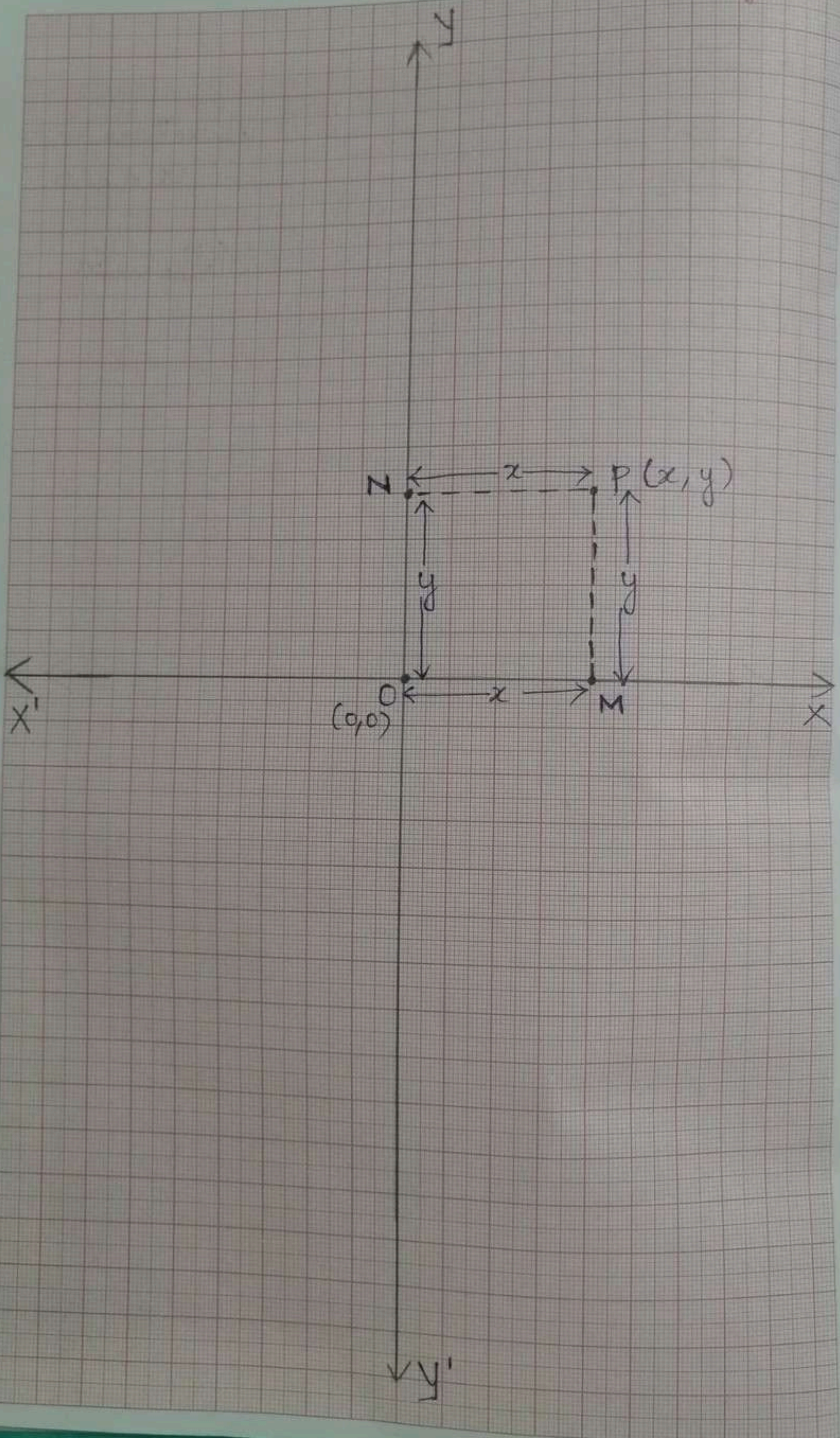
It is the point "O" of intersection of the axes of co-ordinate. The co-ordinates of origin are (0,0).

Abscissa:-

The distance of the point from y-axis is called as Abscissa. In the figure, OM is the abscissa.

Ordinate:-

The distance of the point from x-axis is called as ordinate. In the figure, ON is the

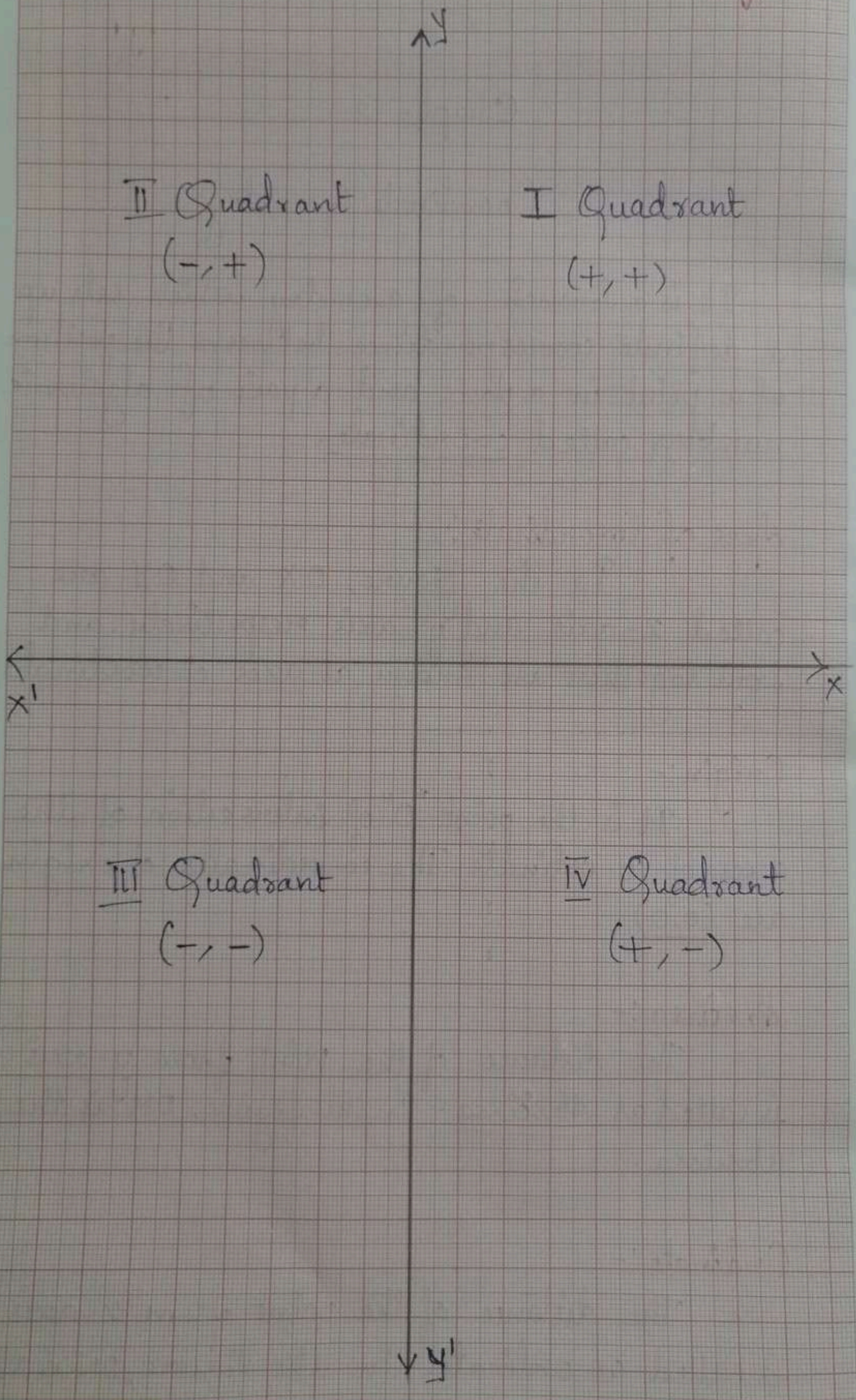

y
N
x
P (x, y)
y
y
X'
O
(0,0)
x
M
X
y'

ordinate.

Quadrant :-

* The axes divide the plane in four parts. These four parts are called quadrants.
* The plane consists of axes and the quadrants.
* The plane is called cartesian plane (or) co-ordinate plane (or) xy plane. These axes are called co-ordinate axes.
* The equation of x-axis is $y = 0$
* The equation of y-axis is $x = 0$

Quadrants	Co-ordinates	
	x	y
I	+	+
II	−	+
III	−	−
IV	+	−

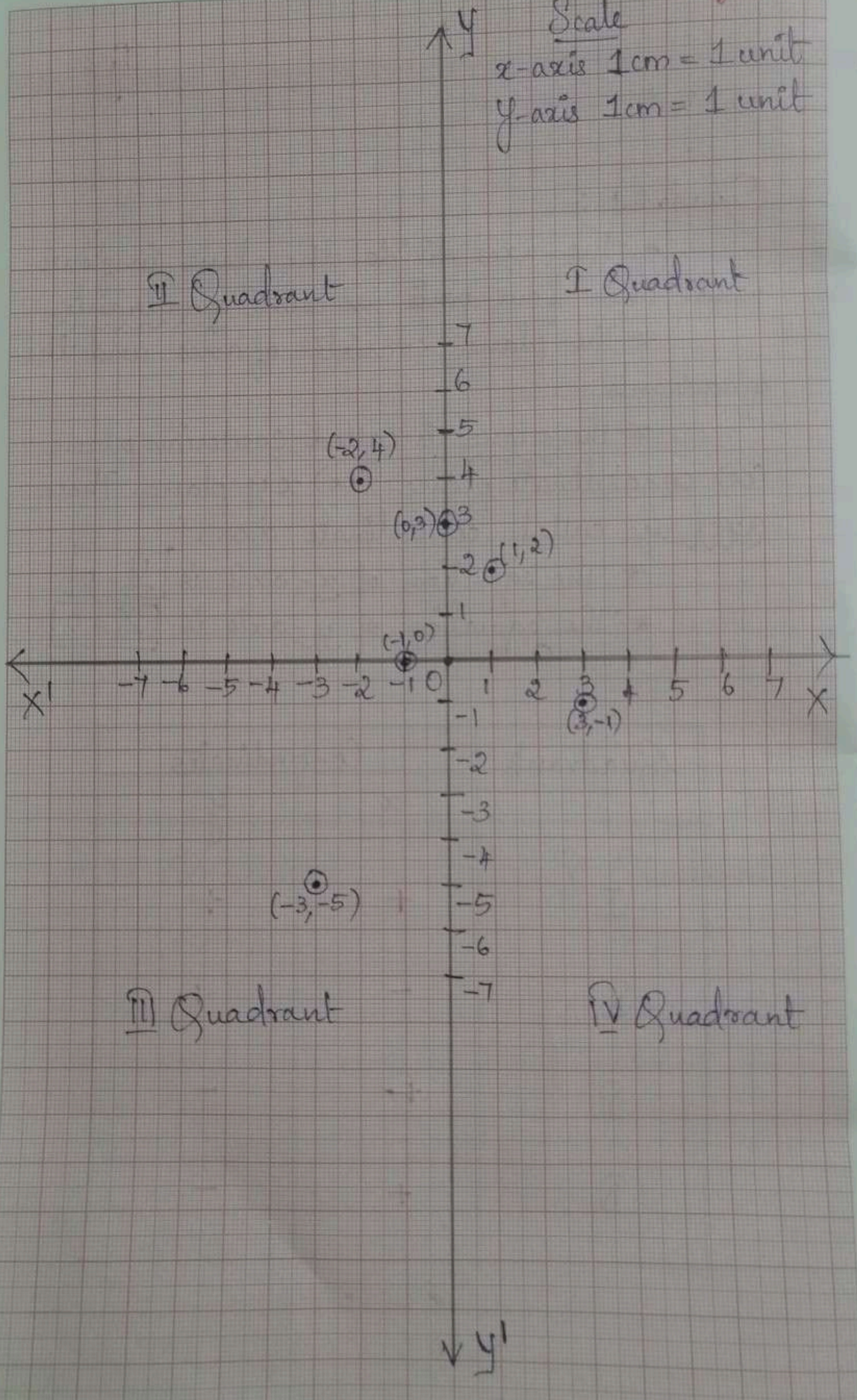

y
II Quadrant
(−, +)
I Quadrant
(+, +)
x'
x
III Quadrant
(−, −)
IV Quadrant
(+, −)
y'

Exercise 3.3

1) In which quadrant (or) on which axis do each of the points $(-2,4)$, $(3,-1)$, $(-1,0)$, $(1,2)$ and $(-3,-5)$, $(0,3)$ lie? Verify your answer by locating them on the cartesian plane.

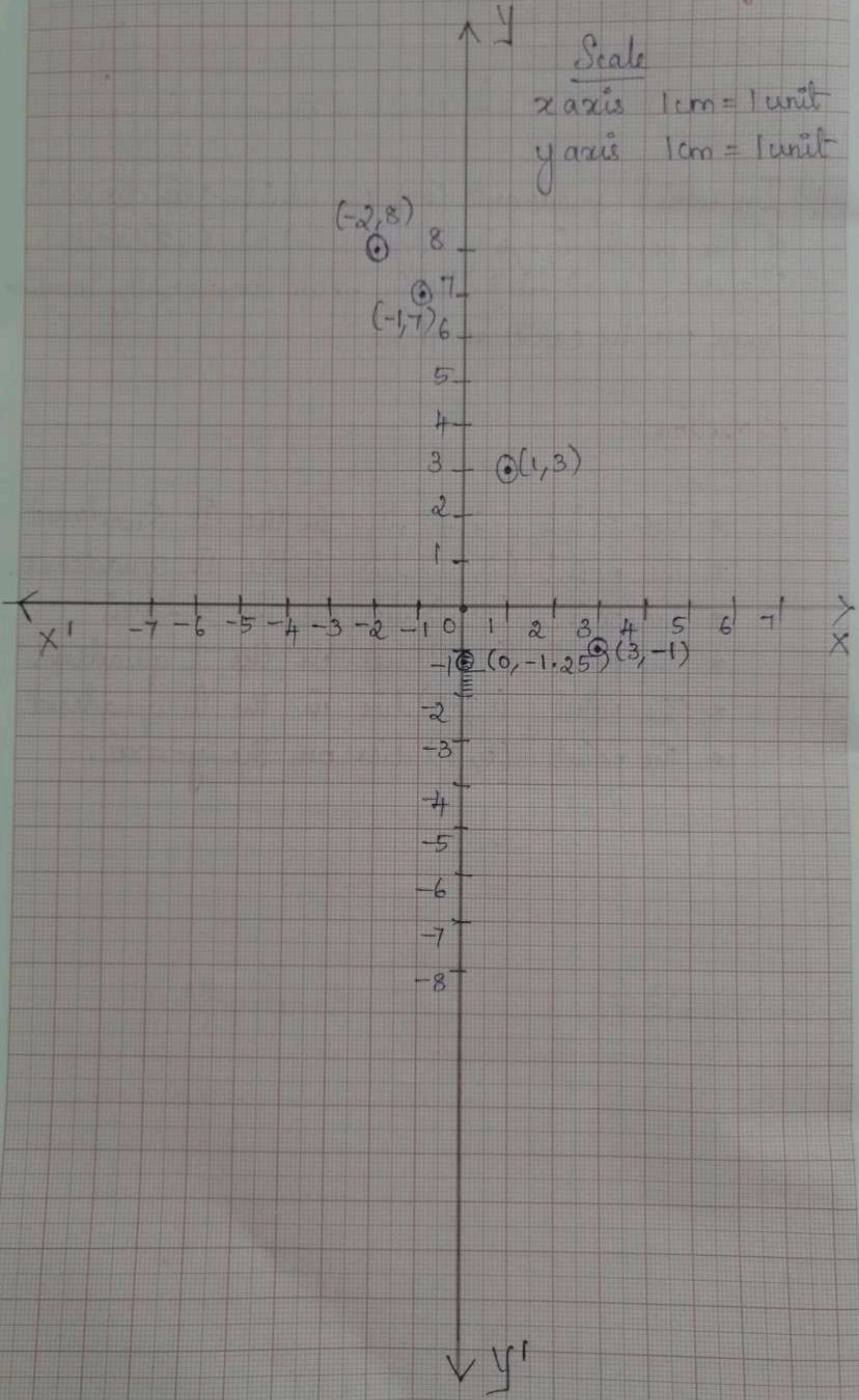
Solution:-

* The point $(-2,4)$ lies in the II Quadrant.
* The point $(3,-1)$ lies in the IV quadrant.
* The point $(-1,0)$ lies on the x-axis
* The point $(1,2)$ lies in the I quadrant
* The point $(-3,-5)$ lies in the III quadrant.
* The point $(0,3)$ lies on the y-axis.


Y
Scale
x-axis 1cm = 1 unit
y-axis 1cm = 1 unit
II Quadrant
I Quadrant
(-2, 4)
(0, 3)
(1, 2)
(-1, 0)
(3, -1)
(-3, -5)
III Quadrant
IV Quadrant
X1
X
Y1

2) Plot the points (x, y) given in the following table on the plane, choosing suitable units of distance on the axis.

x	-2	-1	0	1	3
y	8	7	-1.25	3	-1


y
Scale
x axis 1cm = 1 unit
y axis 1cm = 1 unit
(-2, 8)
(-1, 7)
(1, 3)
(0, -1.25)
(3, -1)
x
8
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
-8
-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7

Extra Questions

1) Plot the points, join them and name the figure formed.

a) A(-2, 2), B(8, 2), C(4, -4), D(-6, -4).

Solution :-

The name of the figure formed is parallelogram

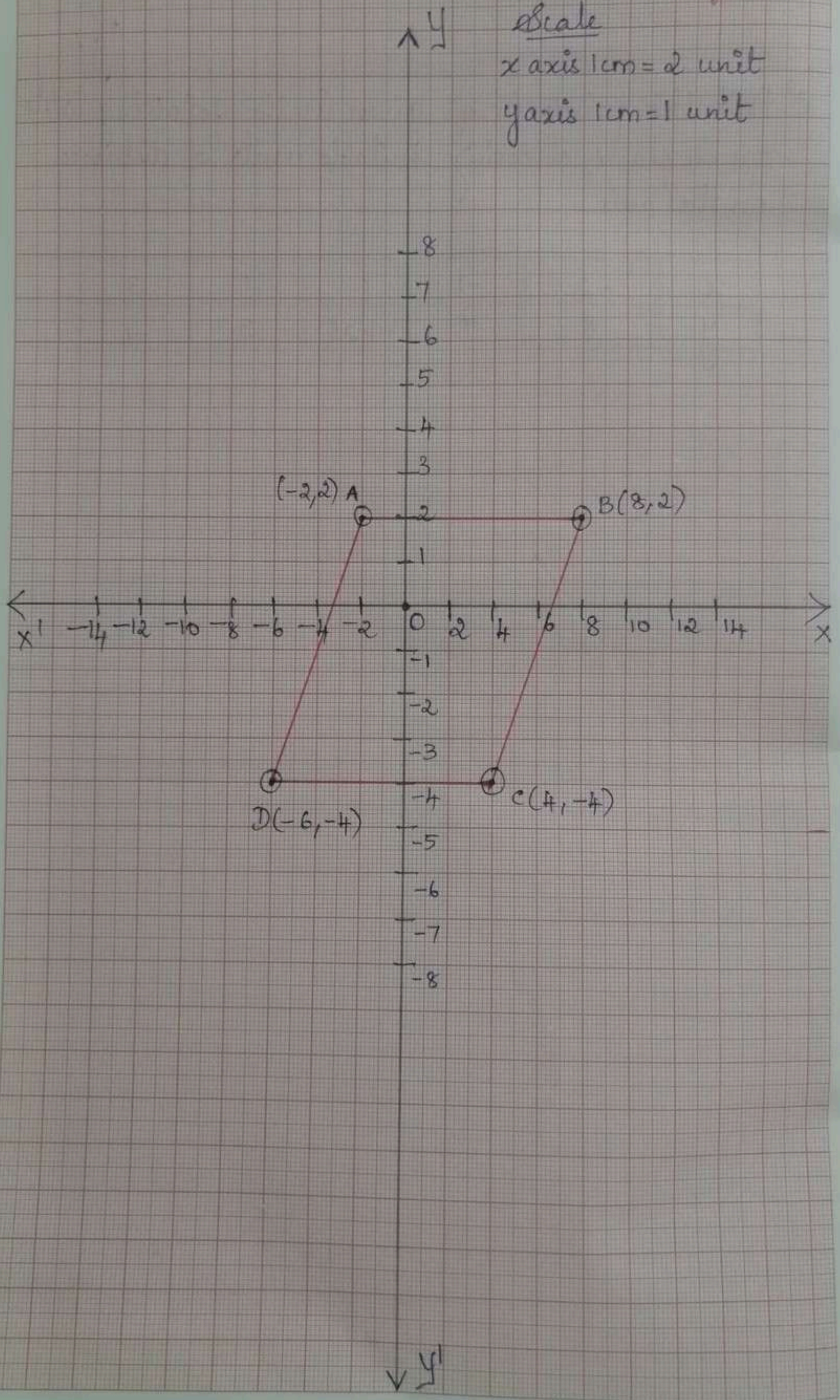
* Opposite sides are parallel (or) of equal length

* Opposite angles are of equal measure.

Scale

x axis 1cm = 2 unit

y axis 1cm = 1 unit

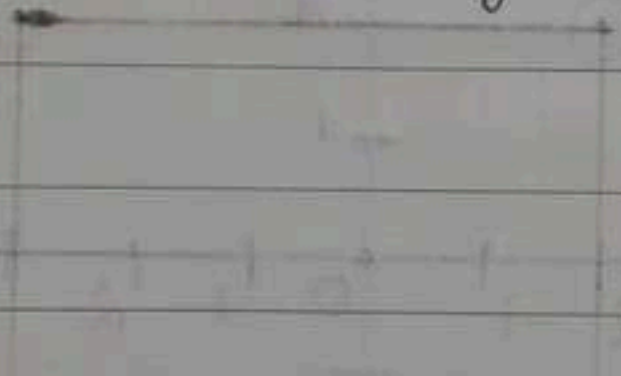


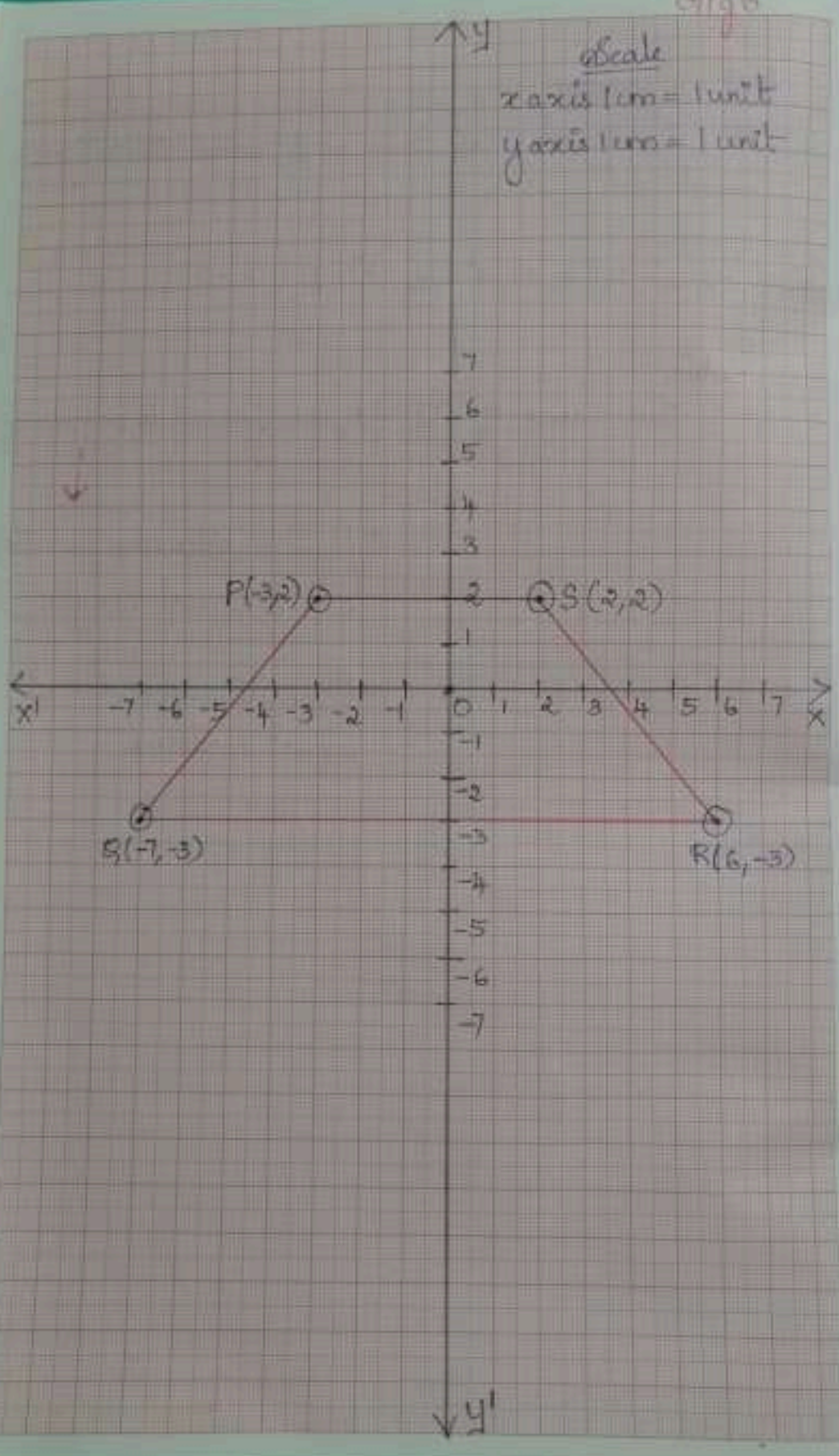
b) P(-3, 2), Q(-7, -3), R(6, -3), S(2, 2)

Solution :-

The name of the figure formed is trapezium.

* Only one pair of parallel sides and are called as bases.
* Other pair of sides are called as legs (or) lateral sides.





b) P(-

c) (3,2), (-2,2), (-2,-2), (3,-2)

Solution:-

c) (3,2), (-2,2), (-2,-2), (3,-2)

Solution:-

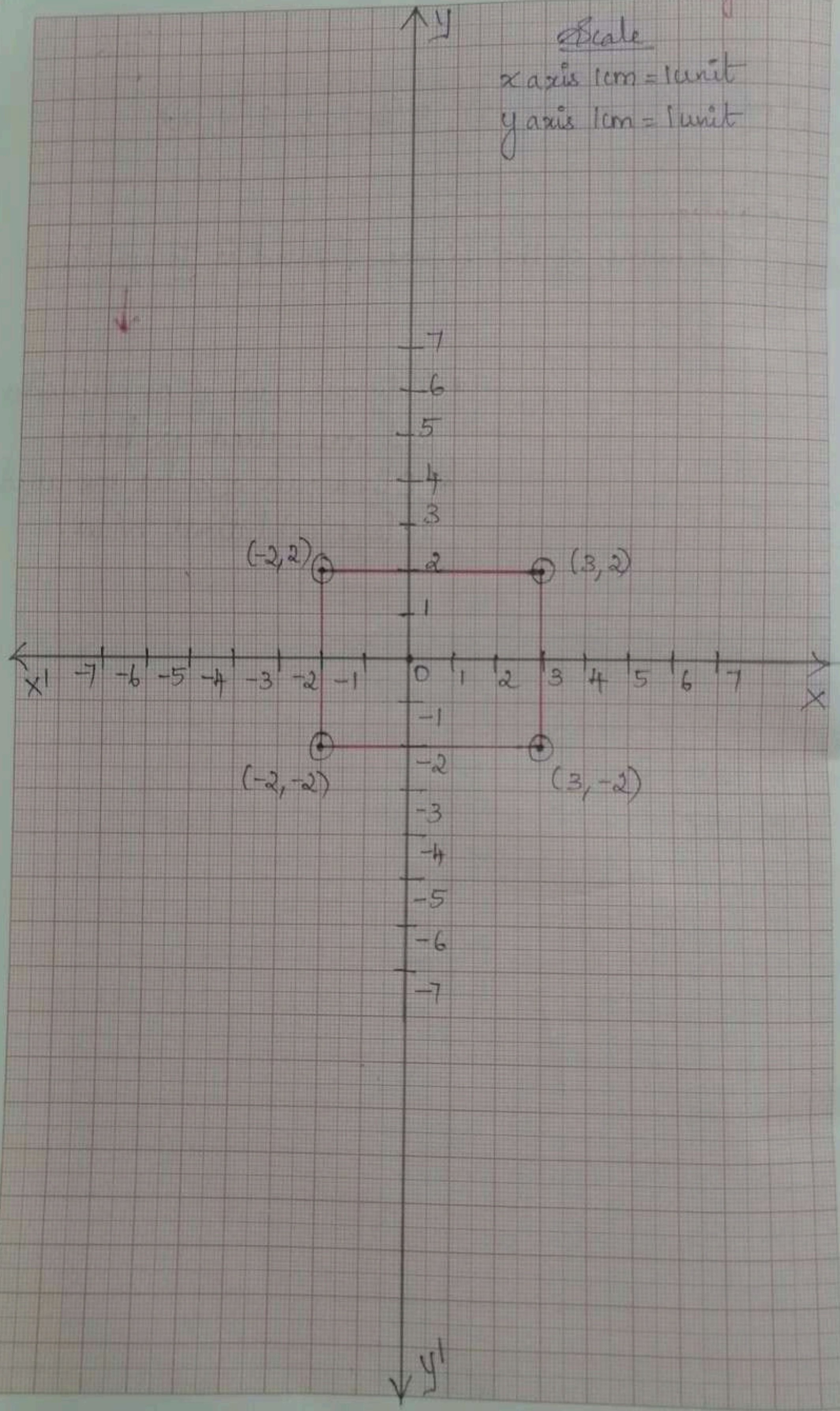
The name of the figure formed is rectangle

* Opposite sides are of equal length
* All angles are of equal degrees and that should be 90°.

Scale

x axis 1cm = 1unit

y axis 1cm = 1unit



2) In figure, find the following,

i) abscissa

ii) ordinate

iii) co-ordinate of P.

Solution :-

i) Abscissa = 2

ii) Ordinate = 5

iii) Co-ordinate of P = (2, 5).

y
Scale
x axis 1cm = 1unit
y axis 1cm = 1unit
7
6
5
4
3
2
1
P
x1 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 x
-1
-2
-3
-4
-5
-6
-7
y1

3) Plot the points and check whether they are collinear (or) not

i) (1, 3), (−1, −1), (−2, −3)

Solution:-

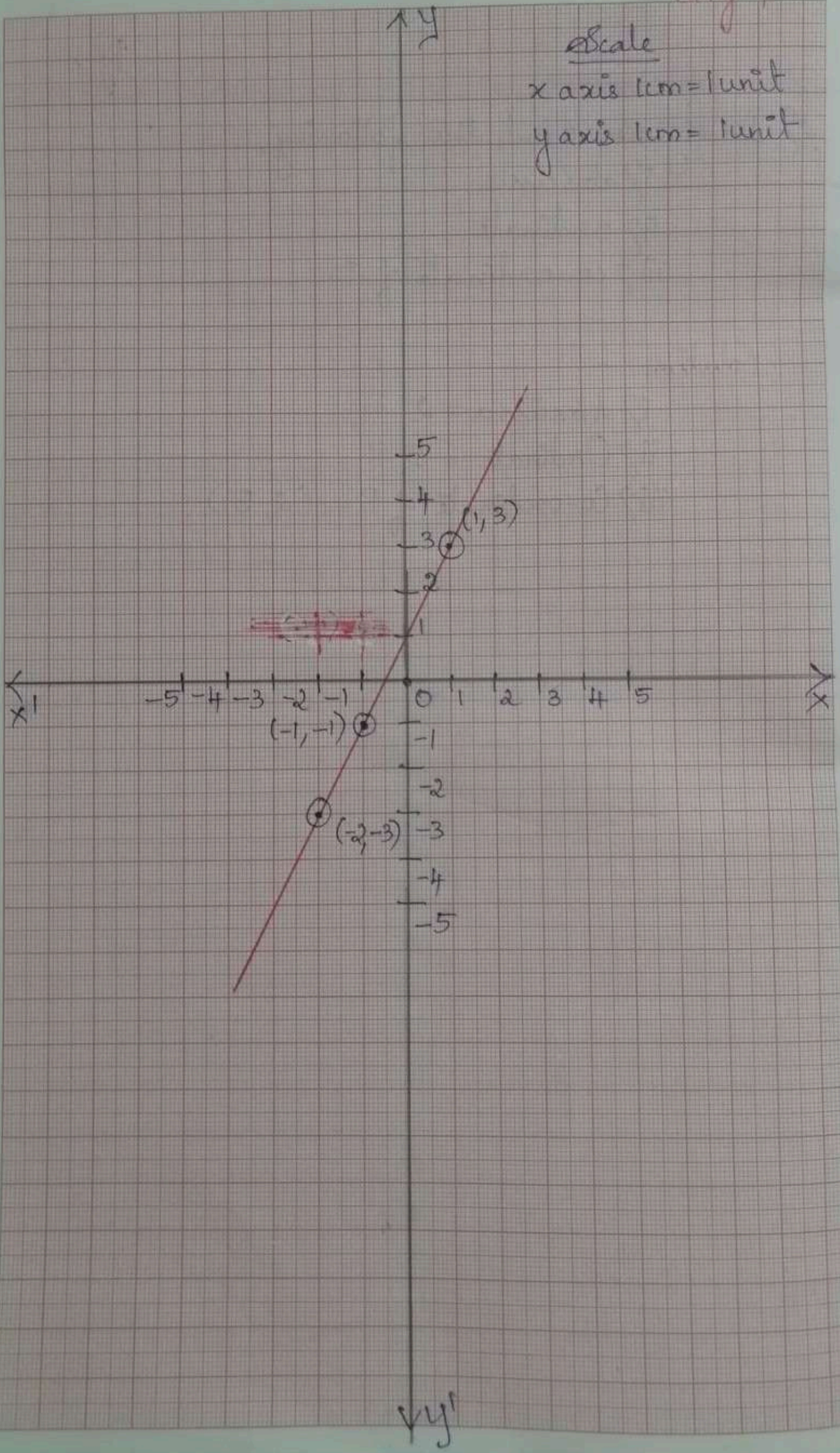
The points are lying in the same line.

∴ They are collinear.

Scale

x axis 1cm = 1unit

y axis 1cm = 1unit



ii) (1, 1), (2, -3), (-1, -2)

Solution :-

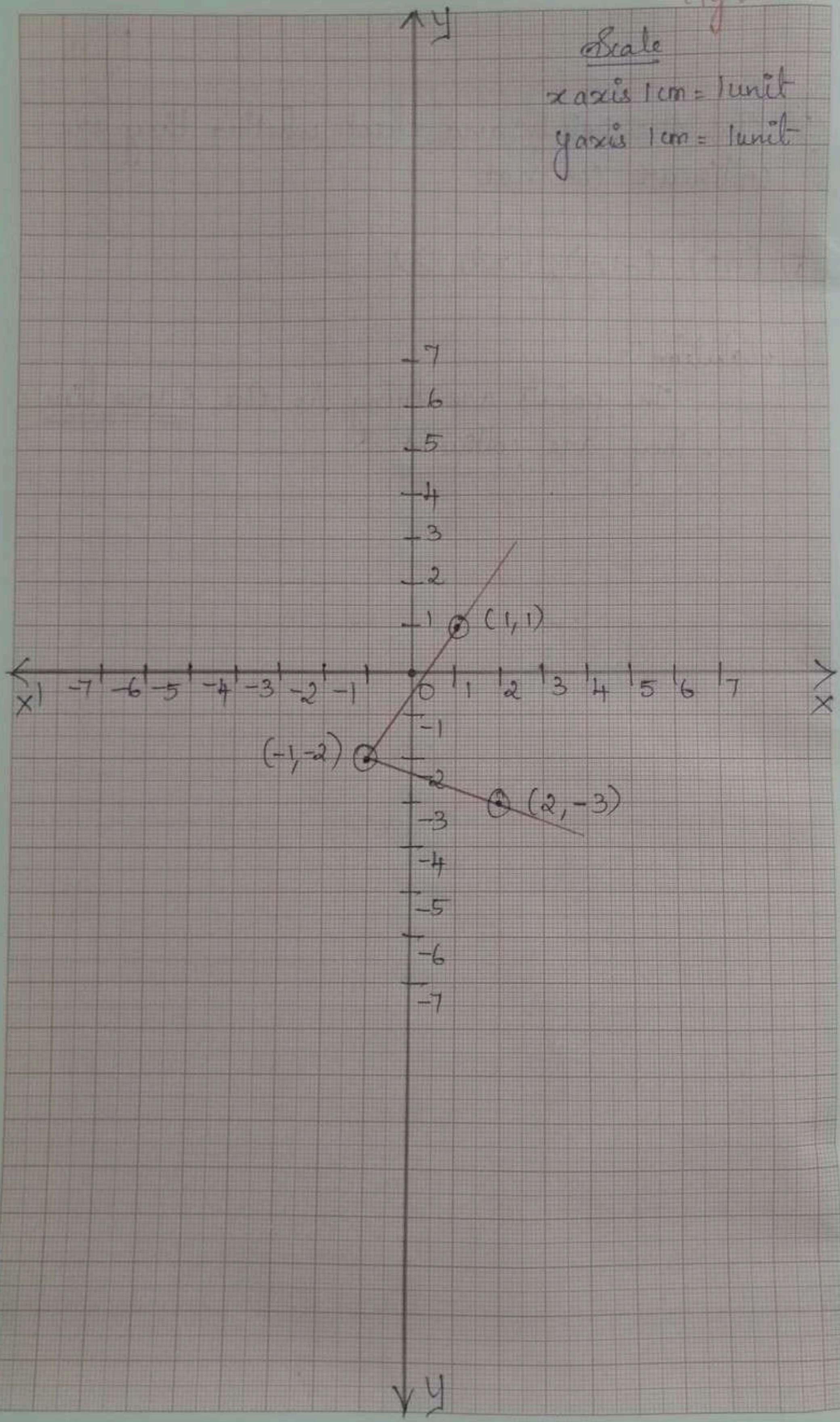
The points are not lying on the same line.

∴ They are not collinear.

Scale

x axis 1 cm = 1 unit

y axis 1 cm = 1 unit

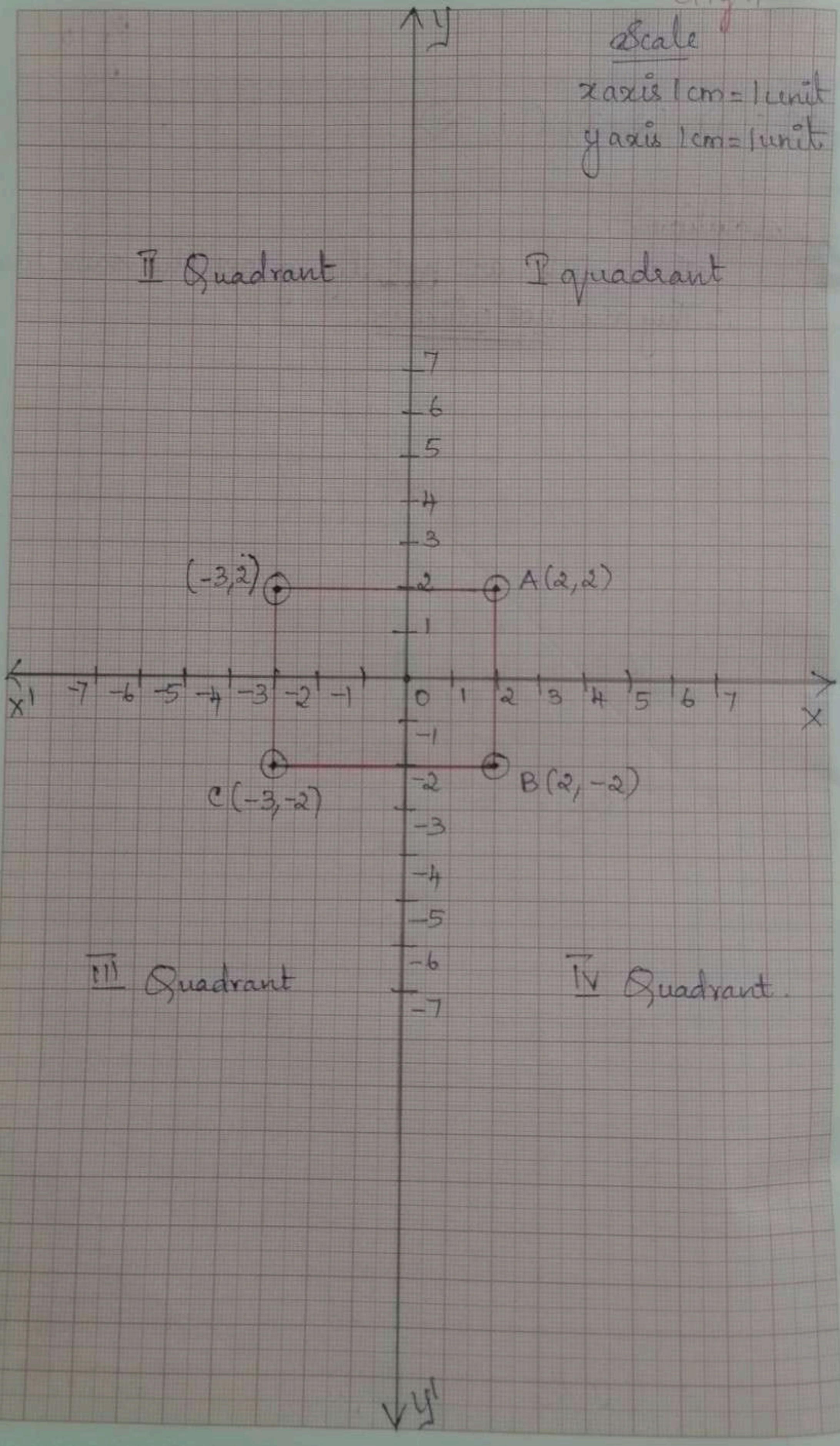


4) Three vertices of a rectangle are A(2,2), B(2,-2) C(-3,-2). Plot the points and then find the co-ordinates of the missing vertex.

Solution :-

The missing vertex is (-3, 2). It is in the II quadrant.

GPg 1)


Scale
x axis 1 cm = 1 unit
y axis 1 cm = 1 unit
II Quadrant
I quadrant
III Quadrant
IV Quadrant.
y
y'
x
x'
(-3,2)
A(2,2)
C(-3,-2)
B(2,-2)
7
6
5
4
3
2
1
-1
-2
-3
-4
-5
-6
-7
0

3 COORDINATE GEOMETRY

EXERCISE 3.2

Q.1. *Write the answer of each of the following questions :*

(i) What is the name of horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane?

(ii) What is the name of each part of the plane formed by these two lines?

(iii) Write the name of the point where these two lines intersect.

Sol. (i) x-axis and y-axis (ii) Quadrants (iii) Origin

Q.2. *See Fig. and write the following :*

(i) The coordinates of B.

(ii) The coordinates of C.

(iii) The point identified by the coordinates (–3, –5).

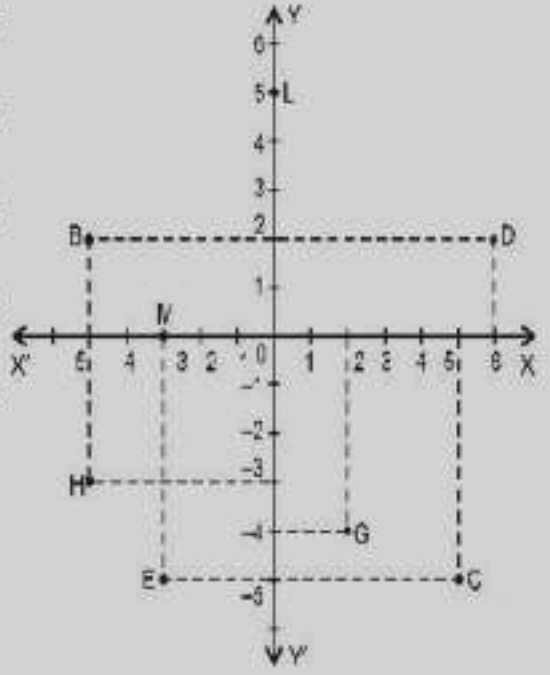
(iv) The point identified by the coordinates (2, – 4).

(v) The abscissa of the point D.

(vi) The ordinate of the point H.

(vii) The coordinates of the point L.

(viii) The coordinates of the point M.



Sol. (i) (–5, 2) (ii) (5, –5)
(iii) E (iv) G
(v) 6 (vi) –3
(vii) (0, 5) (viii) (–3, 0)

3 | COORDINATE GEOMETRY

EXERCISE 3.3

Q.1. *In which quadrant or on which axis do each of the points* (–2, 4), (3, – 1), (–1, 0), (1, 2) *and* (–3, –5) *lie? Verify your answer by locating them on the Cartesian plane.*

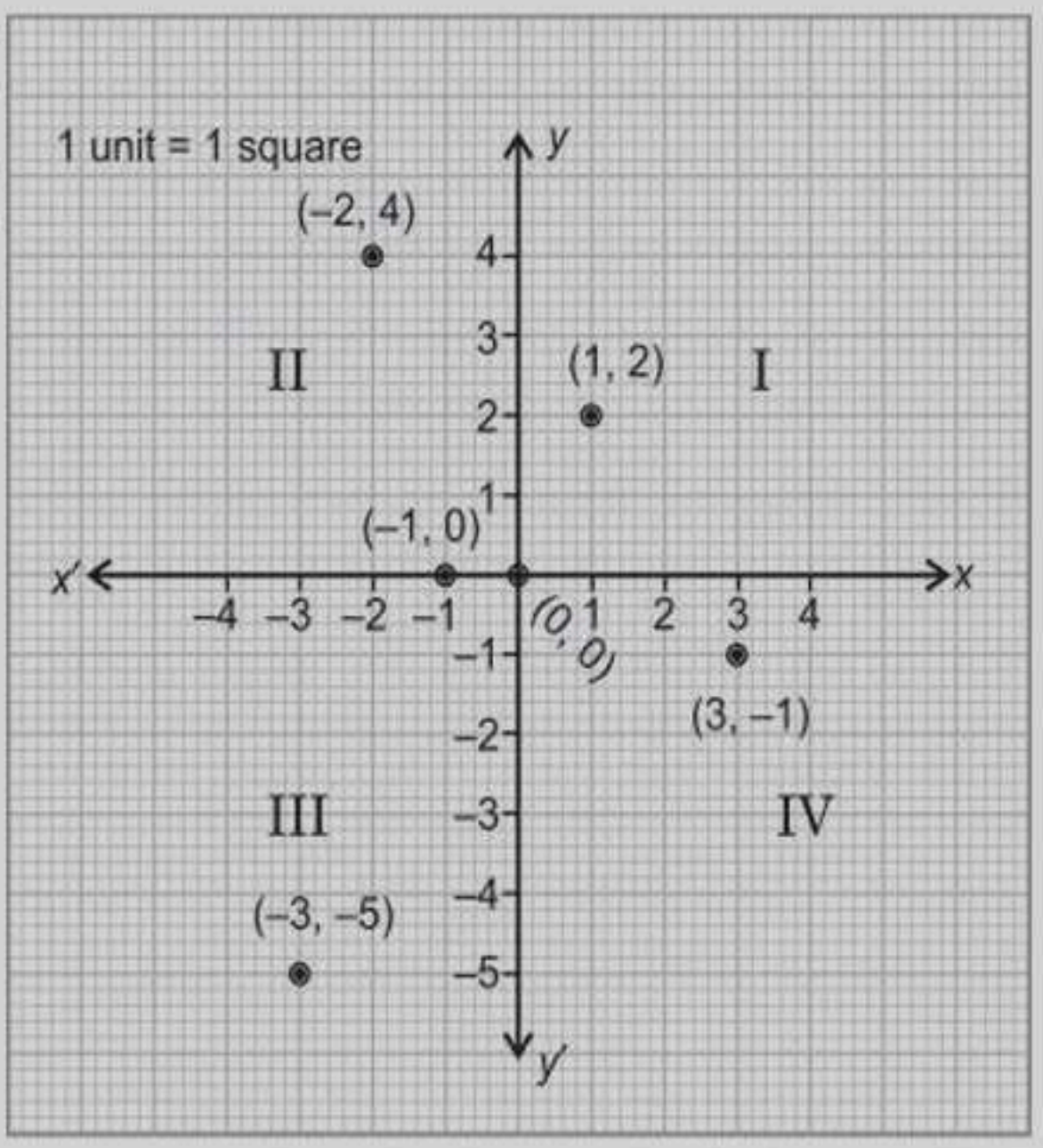
Sol. (–2, 4) : 2nd quadrant

(3, –1) : 4th quadrant

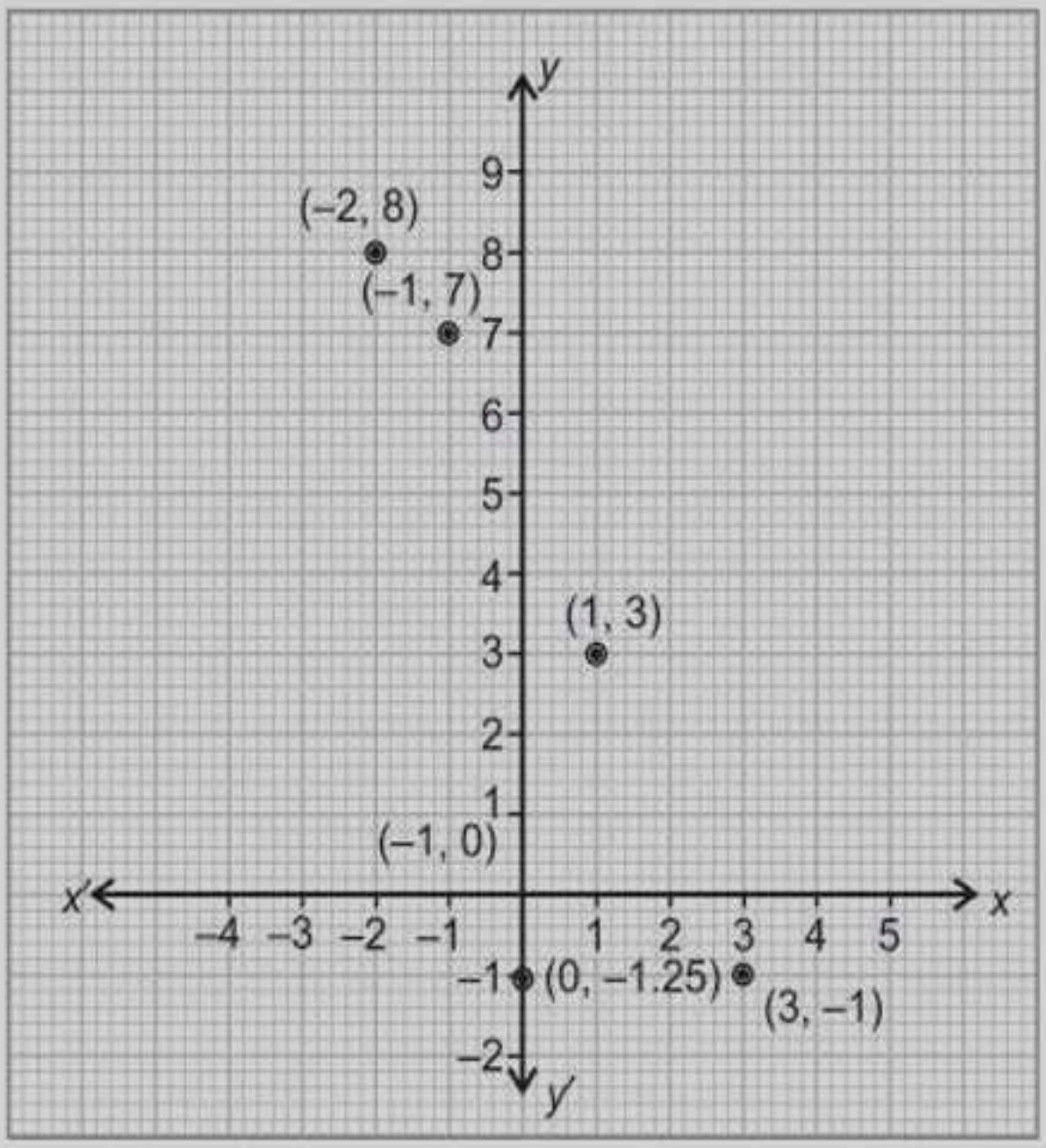
(–1, 0) : x-axis

(1, 2) : 1st quadrant

(–3, –5) : 3rd quadrant



Q.2. *Plot the points (x, y) given in the following table on the plane, choosing suitable units of distance on the axes.*

x	–2	–1	0	1	3
y	8	7	–1.25	3	–1

Sol.