

Coordinate Geometry

- **Coordinate plane**--a two-dimensional surface on which a coordinate system has been set up; invented by Rene Descartes; also called Cartesian plane, graph, coordinate grid.
- **Coordinates**--the numbers in an ordered pair that locate a point in the coordinate plane
- **Ordered pair**--a pair of numbers, written as (x, y) , that represents a point on a coordinate grid
- **Line segment**--the part of a line between two points on the line, including the two points



- **X-axis**--the horizontal number line on a coordinate grid
- **Y-axis**--the vertical number line on a coordinate grid
- **Quadrants** : The four parts made by X and Y axis
- **Origin** : Intersection of X and Y axis
- To plot points, always write the 'x' value first and then the 'y' value.

Ex. (2, 3)

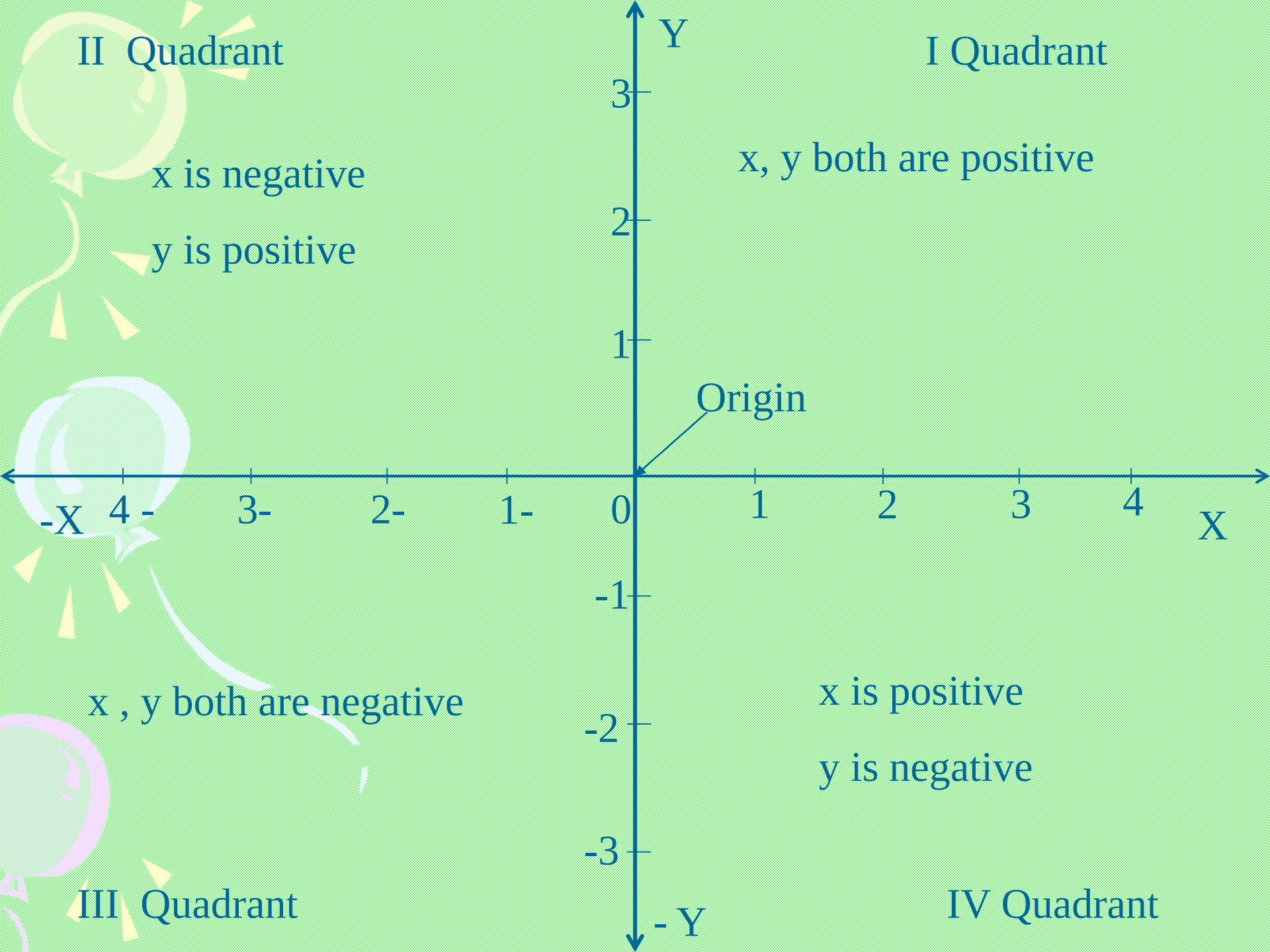
(3, -1)

(-2, 3)

(-3, -2)

- Each of these points represents a point in each of the four quadrants (go through I to IV).

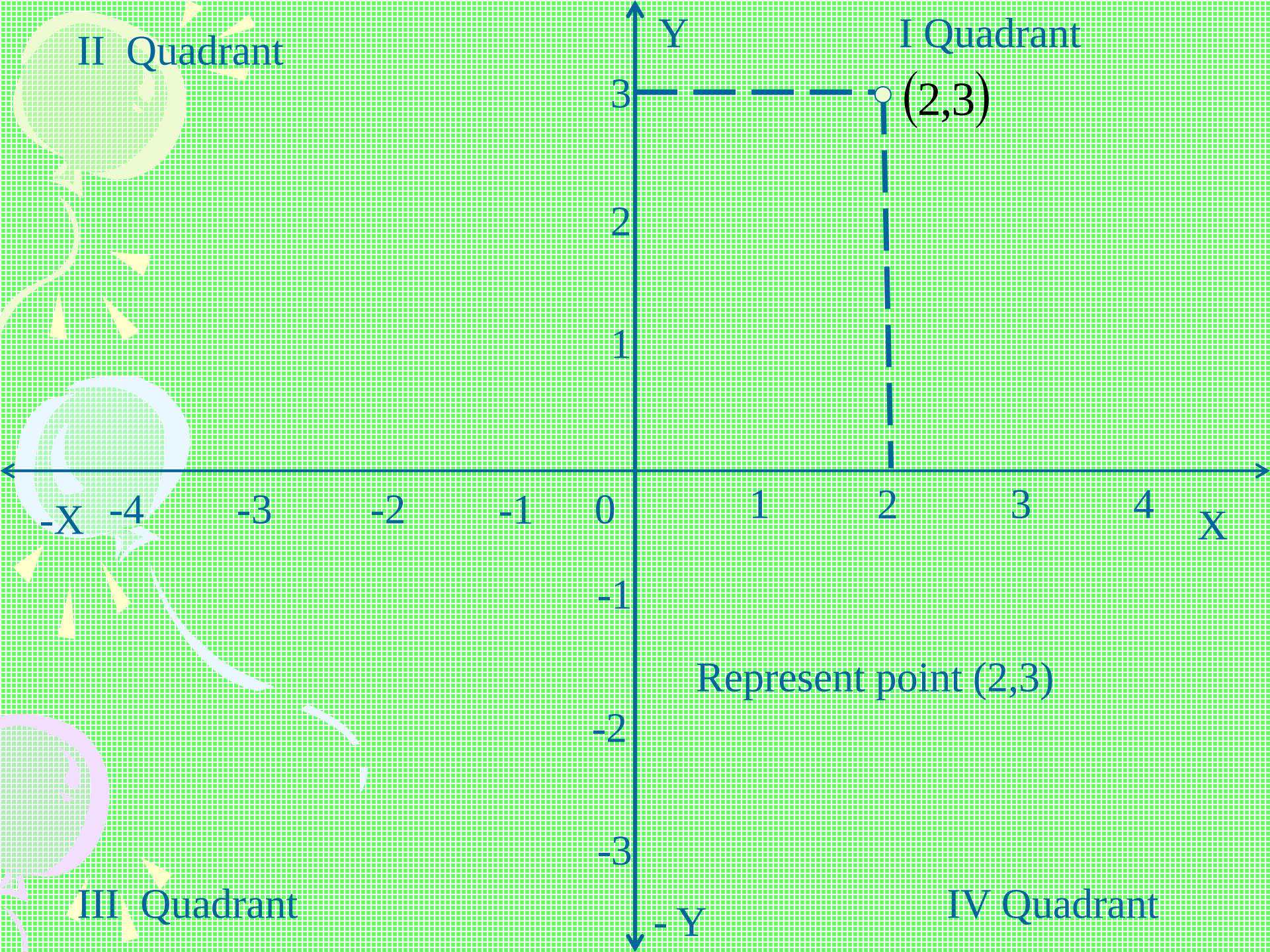


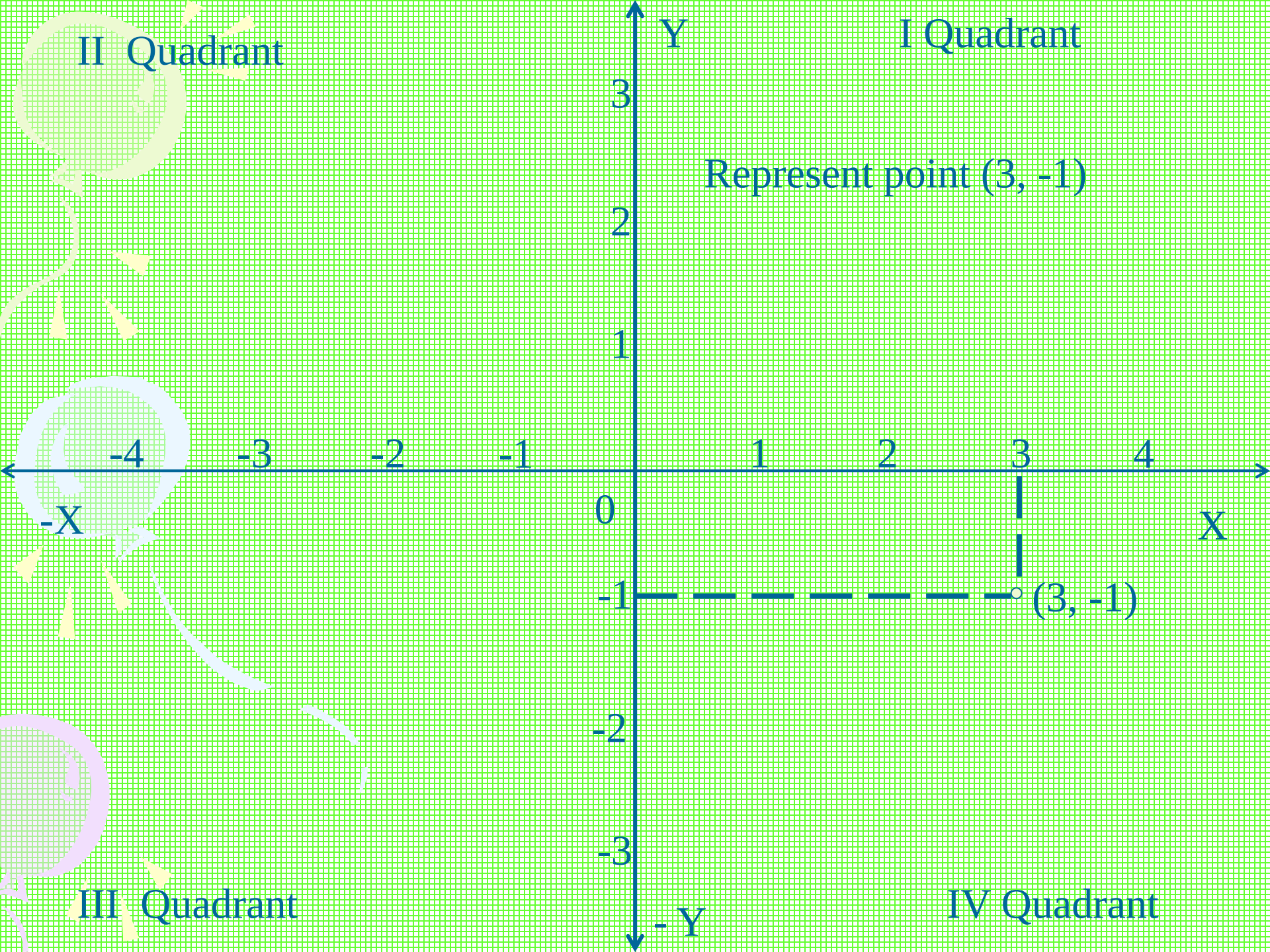


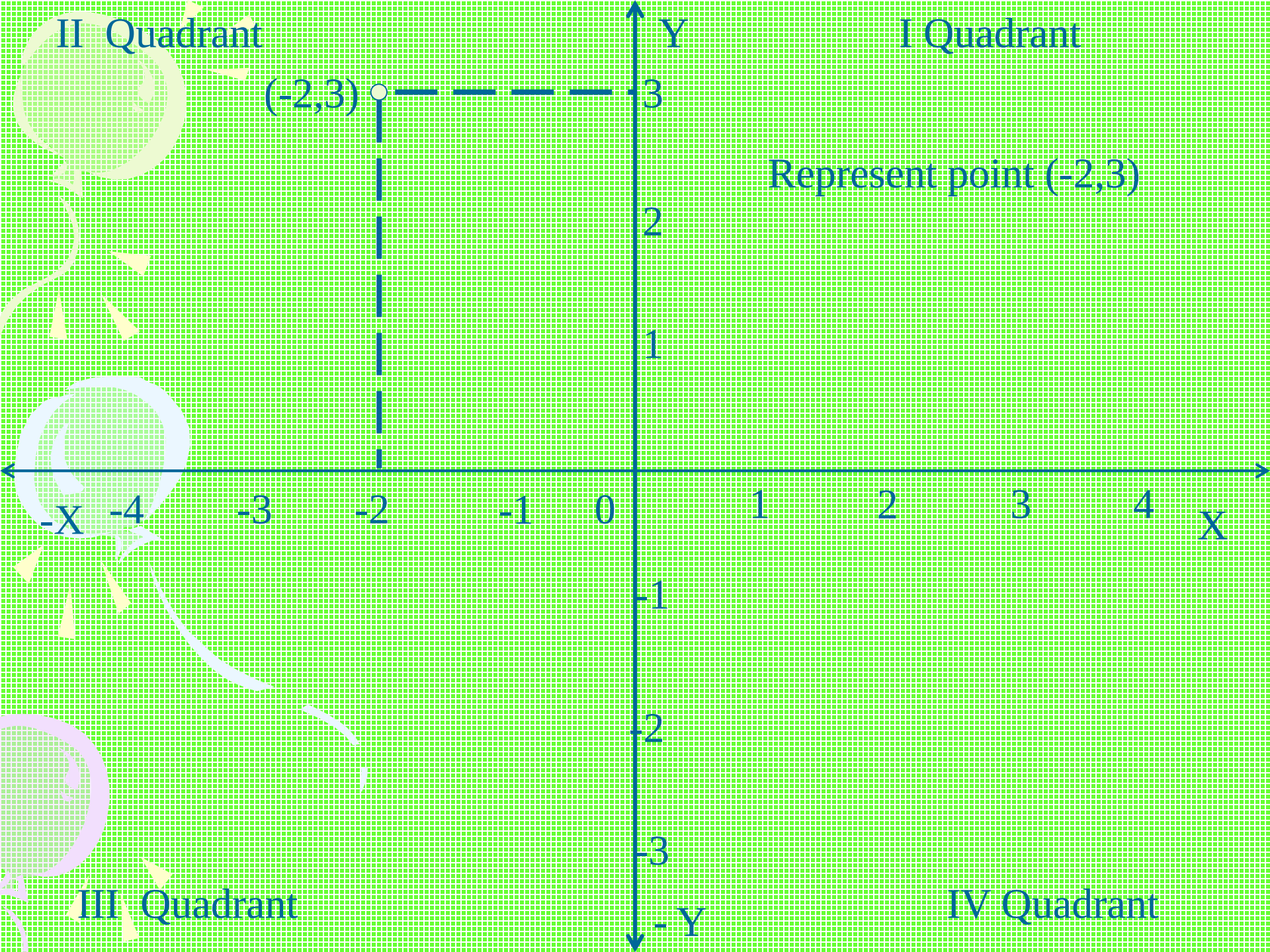
While plotting any points always remember

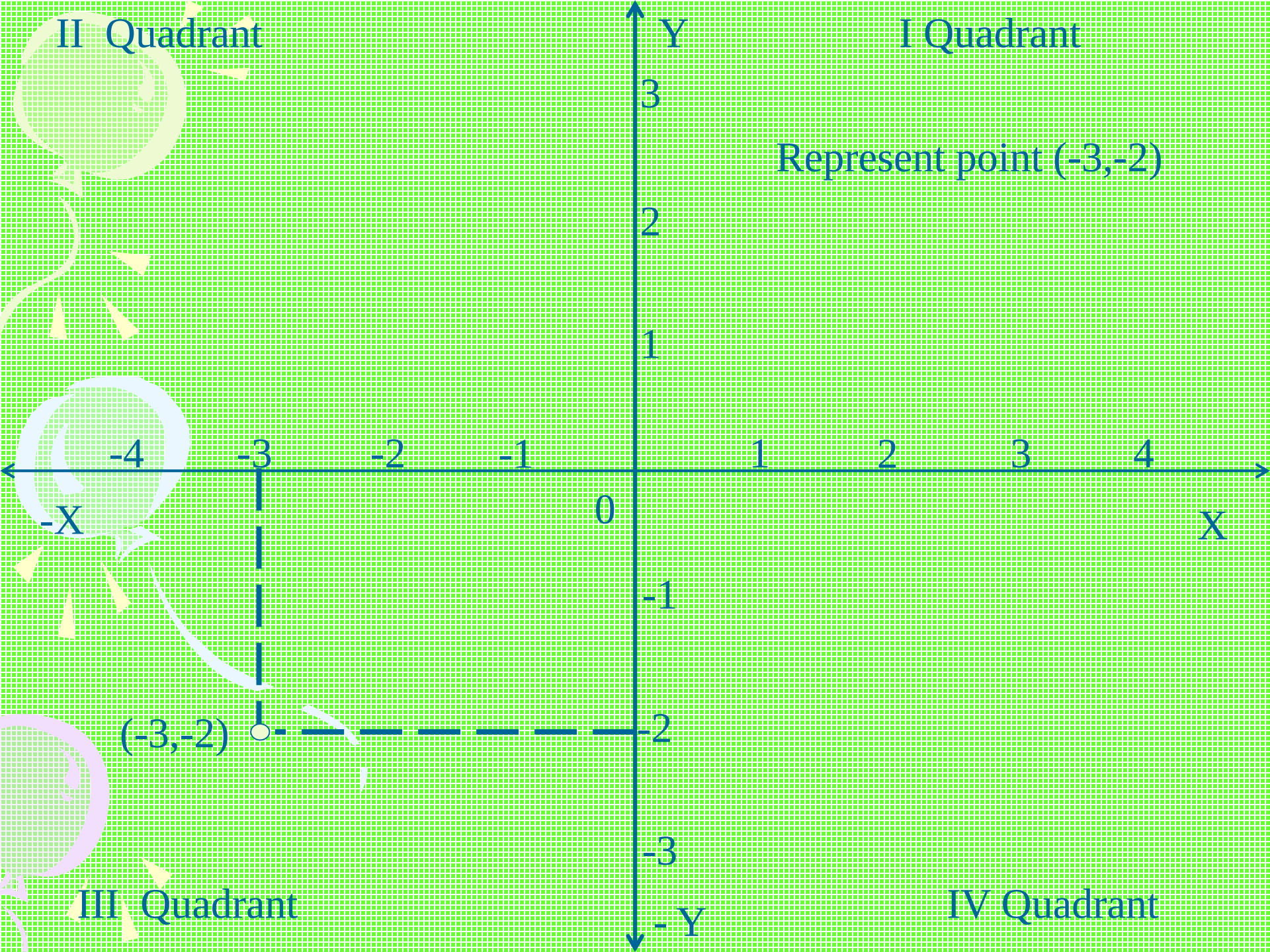
- The first value in the bracket is for x and second value is for y (x, y)
- The following table shows position of points on coordinate system.
- x coordinate is also called as abscissa.
- y coordinate is also called as ordinate.

$(-x, y)$	I Quadrant
$(-x, -y)$	II Quadrant
$(x, -y)$	III Quadrant
$(x, 0)$	IV Quadrant
$(0, y)$	X – axis
	Y – axis



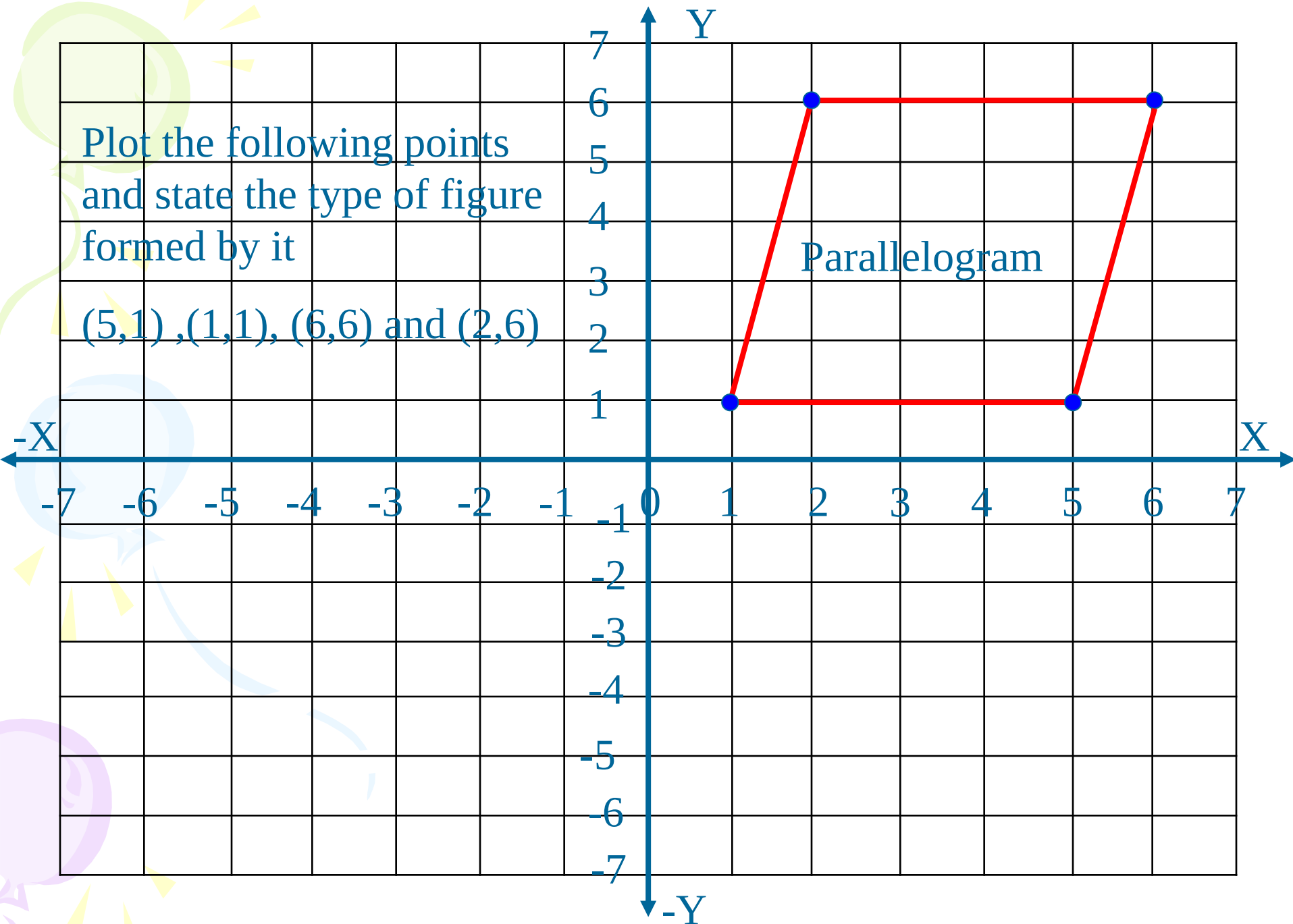


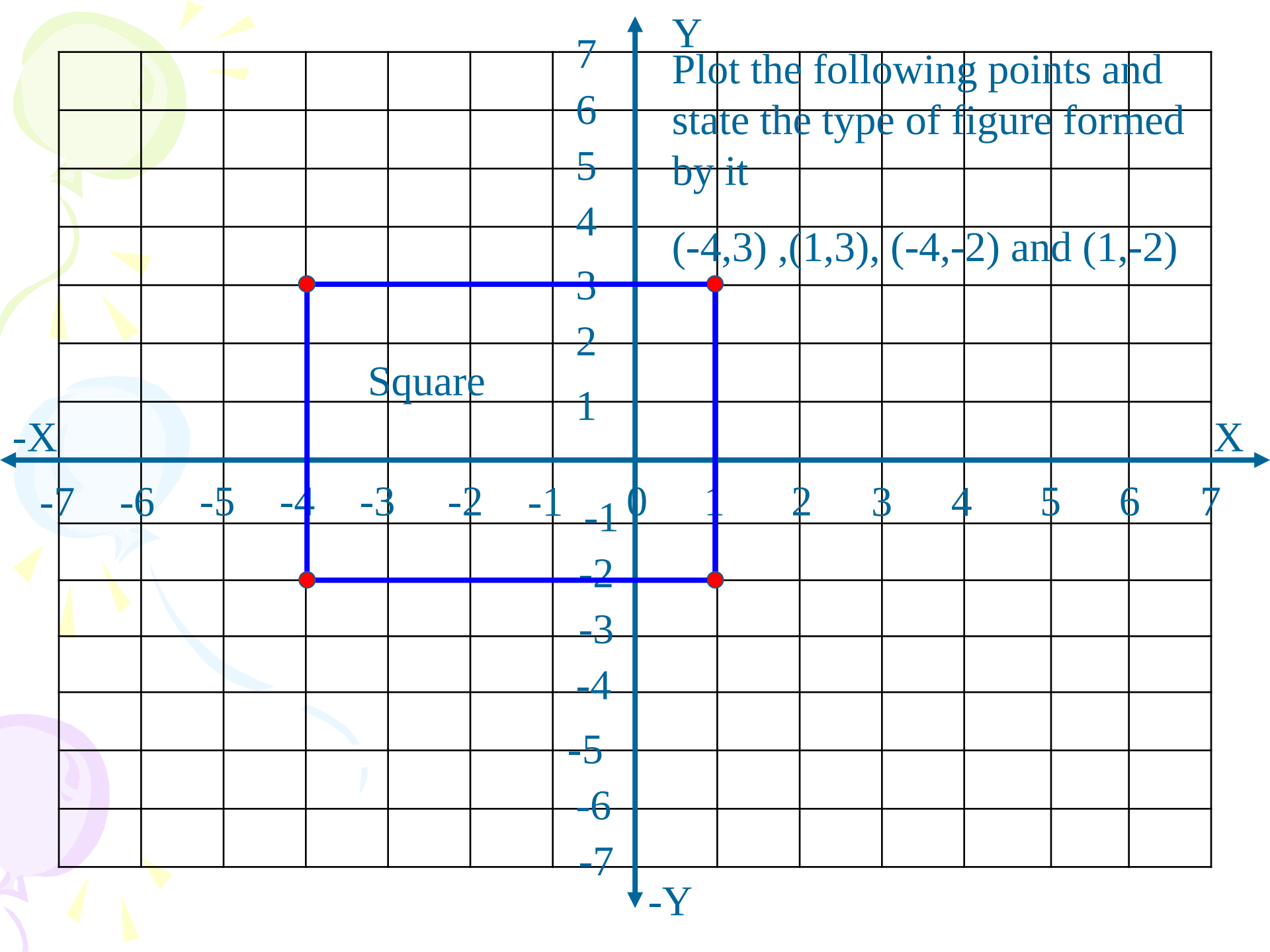




Plot the following points
and state the type of figure
formed by it

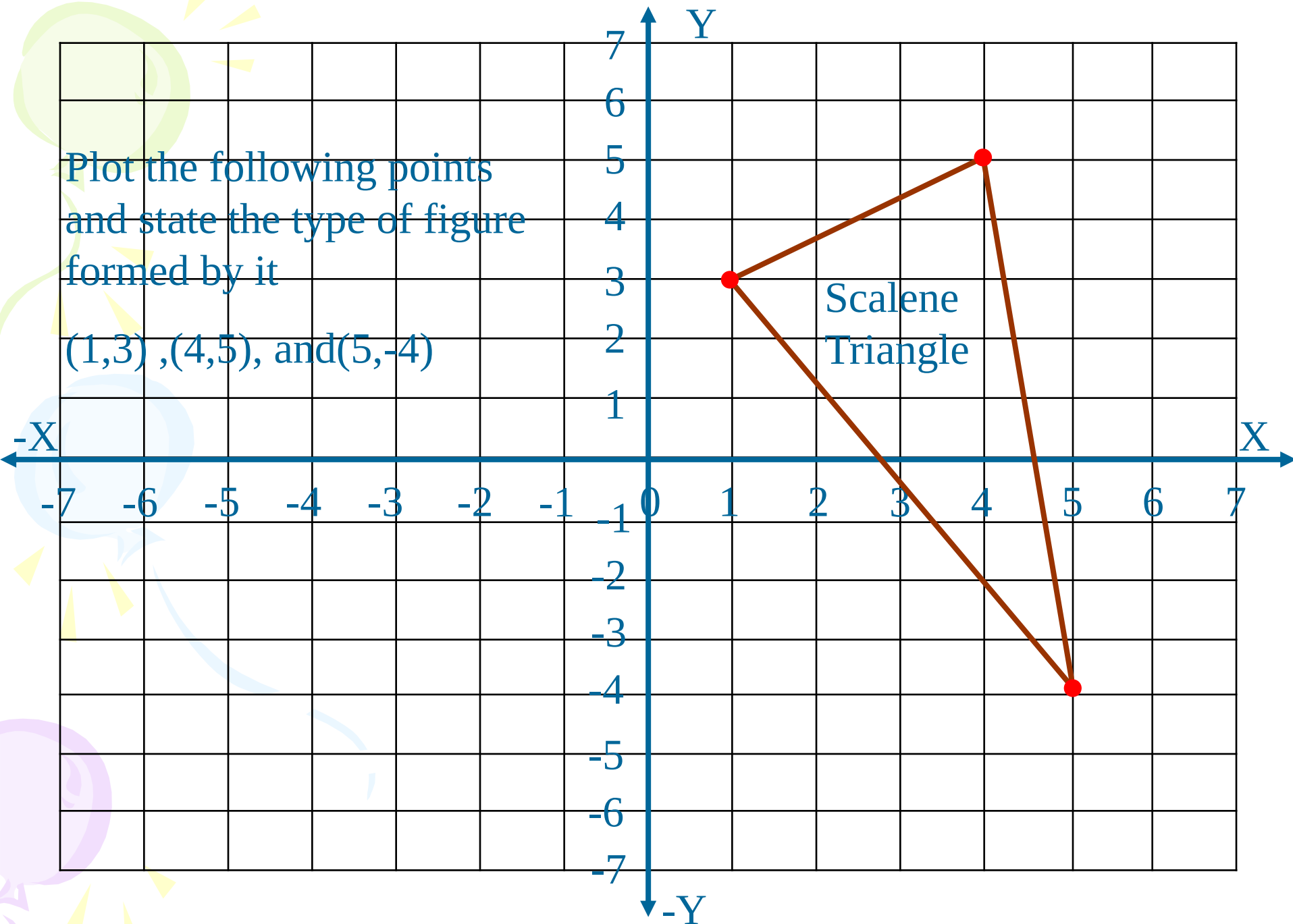
$(5,1)$, $(1,1)$, $(6,6)$ and $(2,6)$

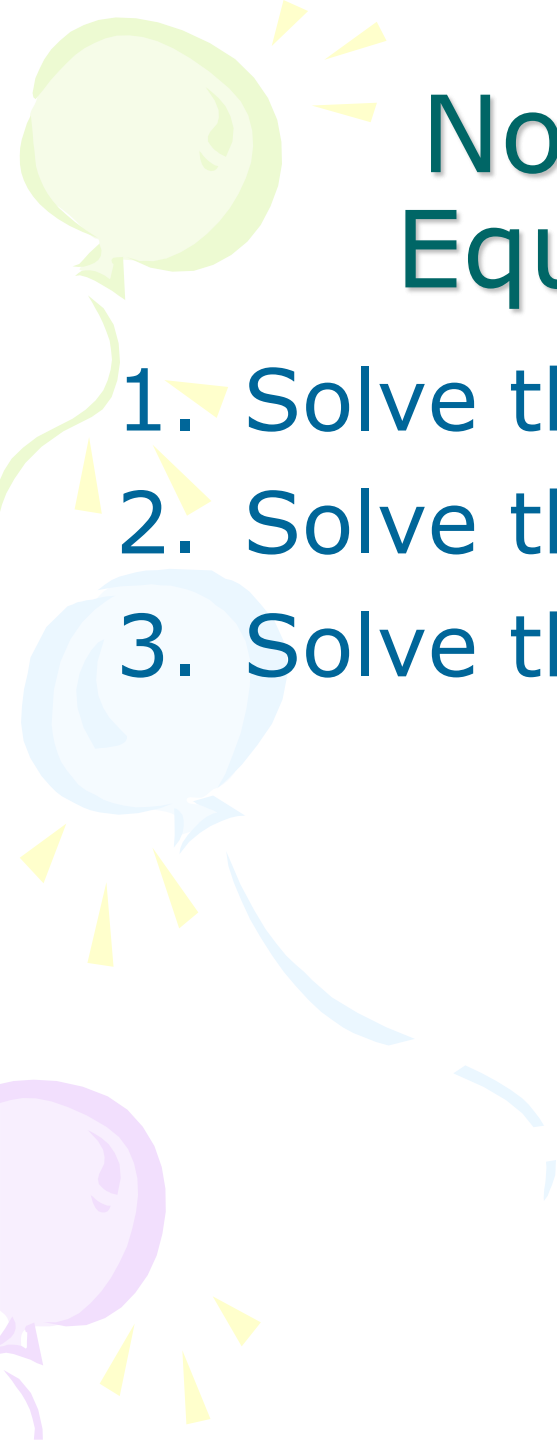




Plot the following points
and state the type of figure
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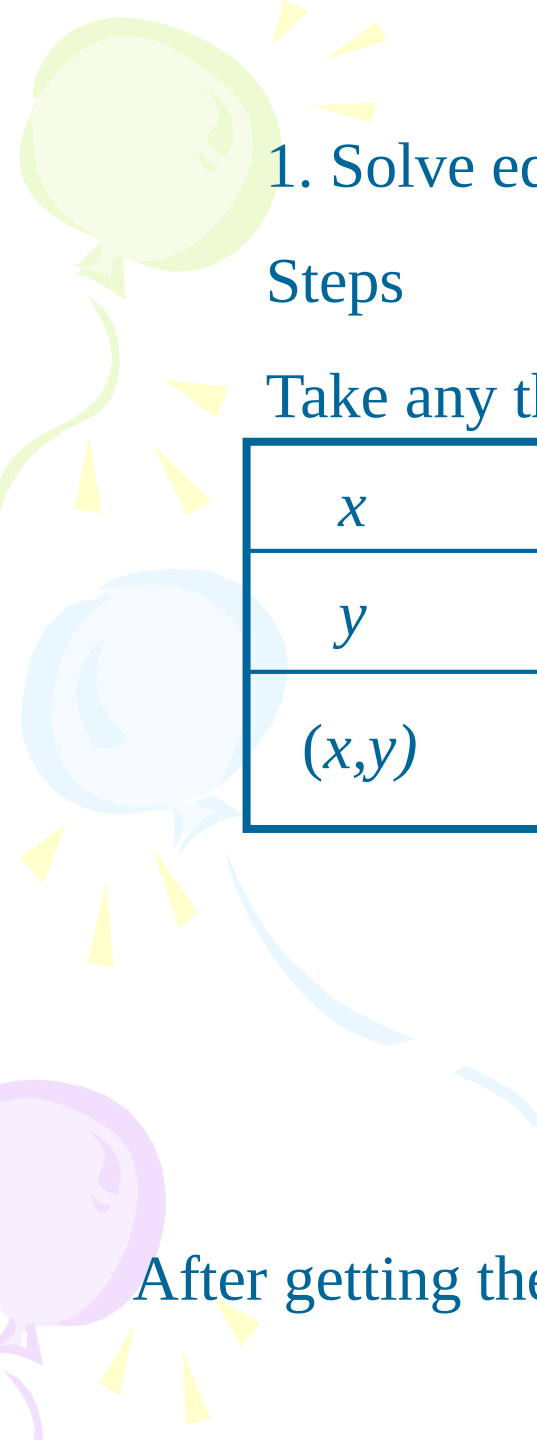
$(1,3)$, $(4,5)$, and $(5,-4)$





Now let us solve the Equations graphically

1. Solve the equation $y = 3x$
2. Solve the equation $x + y = 7$
3. Solve the equation $3x - 5y = 10$



1. Solve equation $y = 3x$

Steps

Take any three values of x and find corresponding value of y

x	1	2	-1
y	3	6	-3
(x,y)	(1,3)	(2,6)	(-1,-3)

1. $y = 3x$

$\therefore y = 3(1)$

$\therefore y = 3$

2. $y = 3x$

$\therefore y = 3(2)$

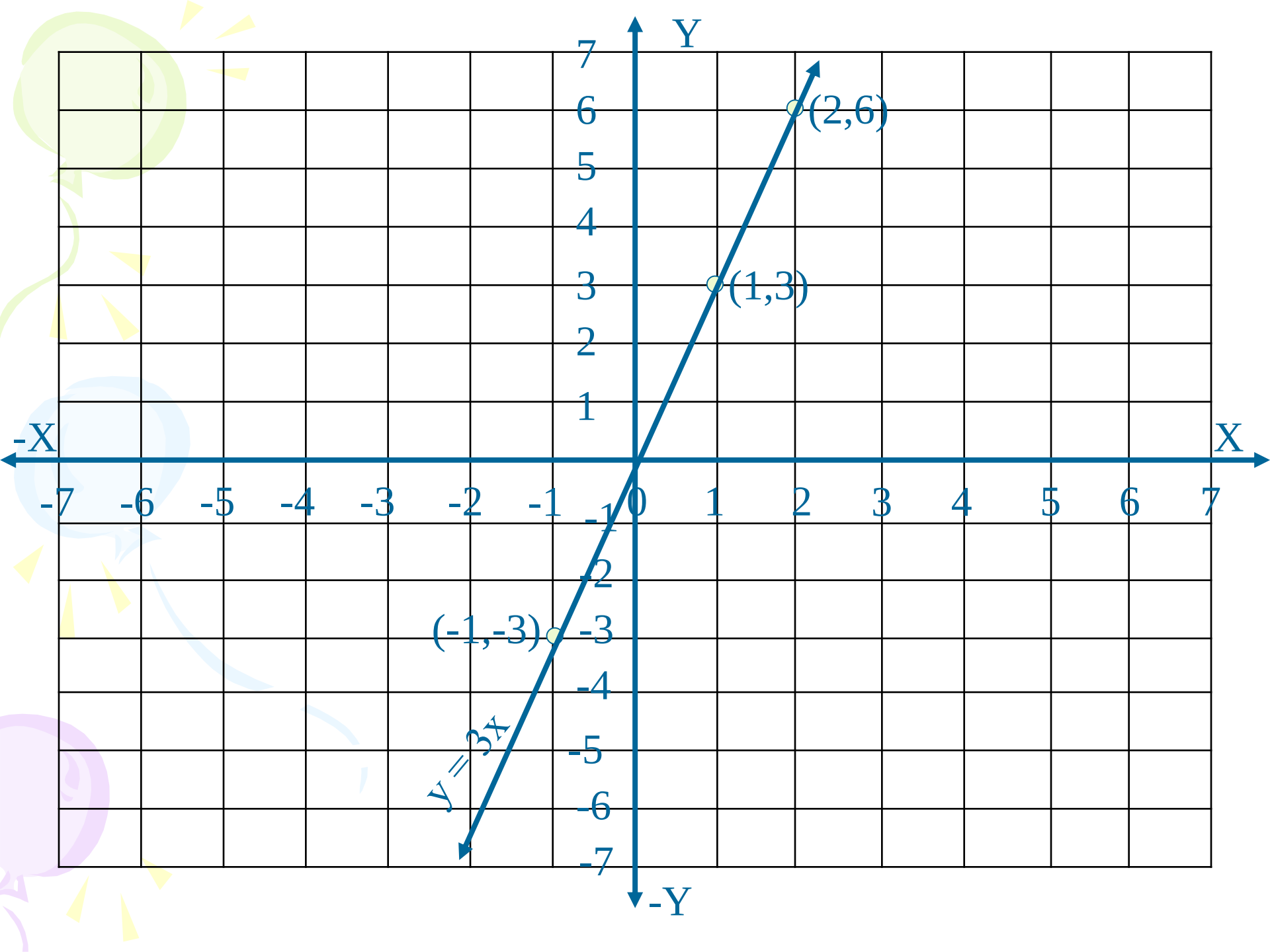
$\therefore y = 6$

3. $y = 3x$

$\therefore y = 3(-1)$

$\therefore y = -3$

After getting these three order pairs plot them on coordinate plane



2. Solve equation $x + y = 7$

Steps

First take x on other side of equation, so that equation becomes $y = 7 - x$

Take any three values of x and find corresponding value of y

x	1	2	0
y	6	5	7
(x,y)	(1,6)	(2,5)	(0,7)

$$1. \ y = 7 - x$$

$$\therefore y = 7 - 1$$

$$\therefore y = 6$$

$$2. \ y = 7 - x$$

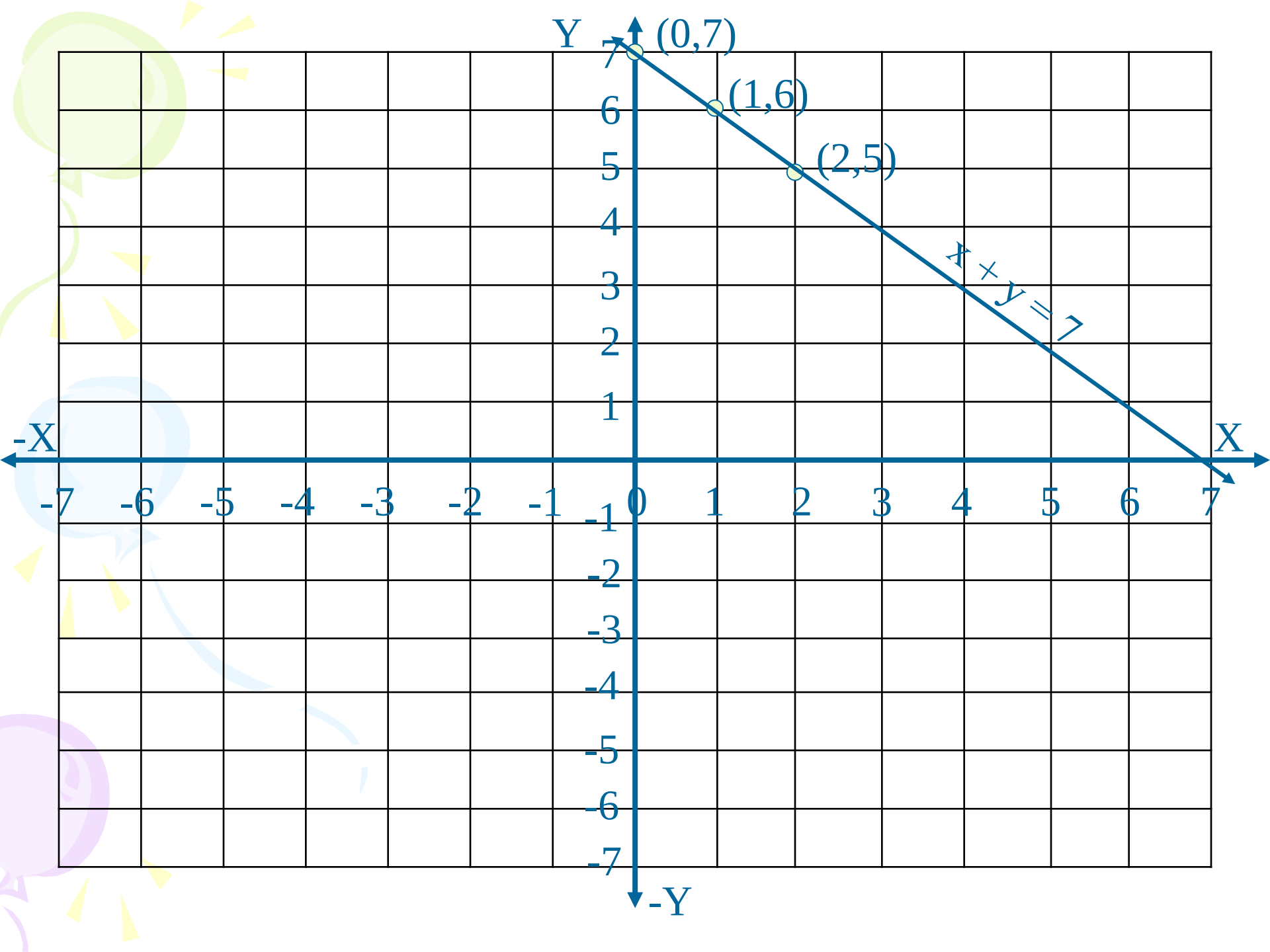
$$\therefore y = 7 - 2$$

$$\therefore y = 5$$

$$3. \ y = 7 - 0$$

$$\therefore y = 7$$

$$\therefore y = 7$$



2. Solve equation $3x - 5y = 10$

Change the subject of given equation to y in the following way:

$$-5y = 10 - 3x$$

$$\therefore 5y = 3x - 10$$

$$\therefore y = \frac{3x - 10}{5}$$

Take any three values of x and find corresponding value of y

x	0	5	-5
y	-2	1	-5
(x,y)	(0,-2)	(5,1)	(-5,-5)

$$1. \quad y = \frac{3x - 10}{5}$$

$$\therefore y = \frac{3(0) - 10}{5}$$

$$\therefore y = -2$$

$$2. \quad y = \frac{3x - 10}{5}$$

$$\therefore y = \frac{3(5) - 10}{5}$$

$$\therefore y = 1$$

$$3. \quad y = \frac{3x - 10}{5}$$

$$\therefore y = \frac{3(-5) - 10}{5}$$

$$\therefore y = -5$$

