

A line has a starting point (9,18) and ending point (14,22). Apply the Bresenham's Line Drawing algorithm to plot a line.

Solution: We have two coordinates,

Starting Point = $(x_1, y_1) = (9, 18)$

Ending Point = $(x_2, y_2) = (14, 22)$

Step 1: First, we calculate $\Delta x, \Delta y$.

$$\Delta x = x_2 - x_1 = 14 - 9 = 5$$

$$\Delta y = y_2 - y_1 = 22 - 18 = 4$$

Step 2: Now, we are going to calculate the decision parameter (p_k)

$$p_k = 2\Delta y - \Delta x$$

$$= 2 \times 4 - 5 = 3$$

The value of $p_k = 3$

Step 3: Now, we will check both the cases.

If

$$p_k \geq 0$$

Then

Case 2 is satisfied. Thus

$$p_{k+1} = p_k + 2\Delta y - 2\Delta x = 3 + (2 \times 4) - (2 \times 5) = 1$$

$$x_{k+1} = x_k + 1 = 9 + 1 = 10$$

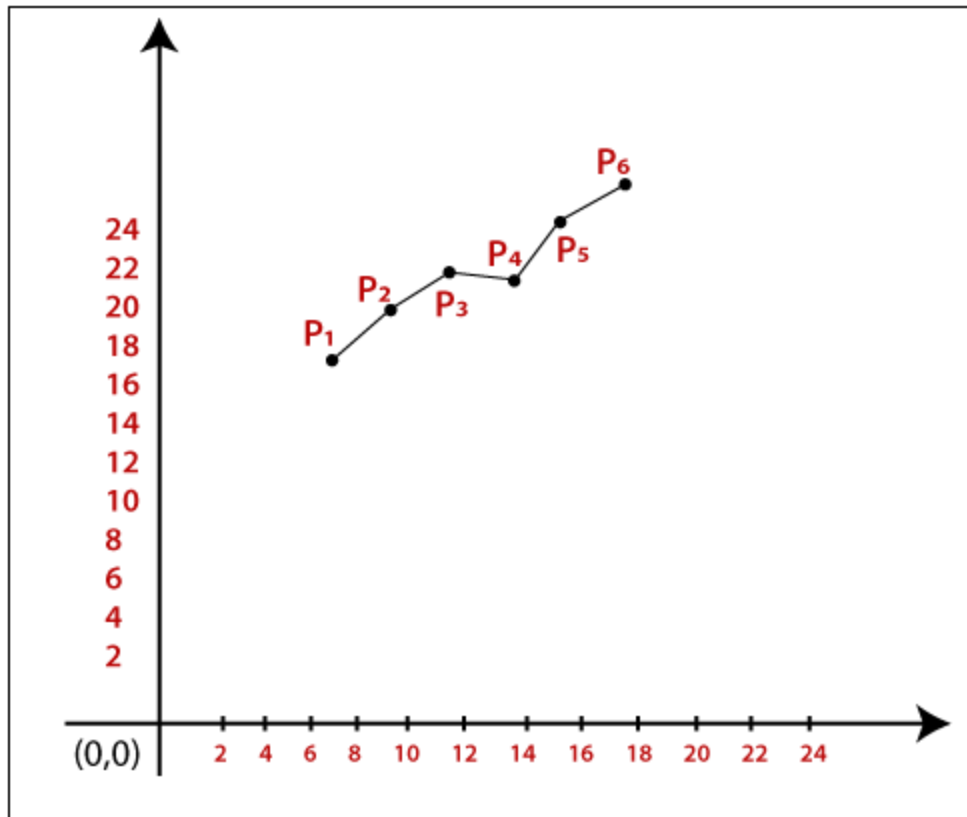
$$y_{k+1} = y_k + 1 = 18 + 1 = 19$$

Step 4: Now move to next step. We will calculate the coordinates until we reach the end point of the line.

$$\Delta x - 1 = 5 - 1 = 4$$

p_k	p_{k+1}	x_{k+1}	y_{k+1}
		9	18
3	1	10	19
1	-1	11	20
-1	7	12	20
7	5	13	21
5	3	14	22

Step 5: Stop.



The Coordinates of drawn lines are-

$$P_1 = (9, 18)$$

$$P_2 = (10, 19)$$

$$P_3 = (11, 20)$$

$$P_4 = (12, 20)$$

$$P_5 = (13, 21)$$

$$P_6 = (14, 22)$$