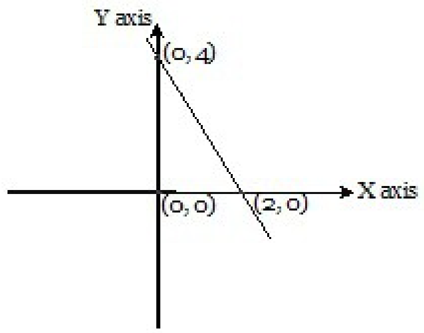
If you haven't read part I of this topic, I strongly suggest you read it first: Bagging the Graphs – Part I

Would you say it is easy breezy to draw a line if two points through which it passes are given? Sure. Plot the points approximately and join them! There you have your required line.

A quick method of drawing the line represented by an equation: find two points through which it passes, plot the points and join them.

The easiest points to find are x and y intercepts. Let's say I have the equation $2x + y – 4 = 0$. In this equation, if I put $x = 0$, I get $y = 4$ (the y intercept). This means the point (0, 4) lies on the line. If I put $y = 0$, I get $x = 2$ (the x intercept). So the point (2, 0) lies on the line too. Plot them and join them.



Are you wondering why I worked with the slope first when this easy method existed? Because slope method has its own utility and will come in very handy in some questions. Anyway, I had a nagging feeling that if I suggested this approach first, you may not bother about the slope concept at all!

One data sufficiency question to bind it all:

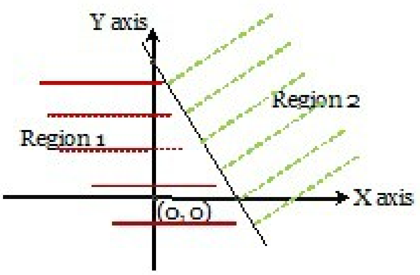
Question: Every point in the xy plane satisfying the condition $ax + by \geq c$ is said to be in region R. If a, b and c are real numbers, does any point of region R lie in the third quadrant?

Statements:

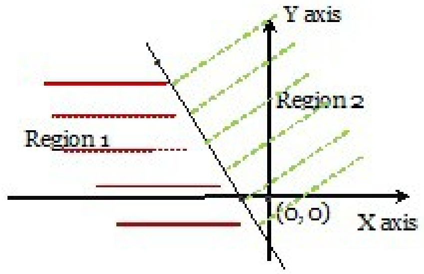
1. Slope of the line represented by $ax + by – c = 0$ is 2.
2. The line represented by $ax + by – c = 0$ passes through (-3, 0).

Solution:

First of all, notice that $ax + by – c = 0$ or $ax + by = c$ is the equation of the same line. A line divides the plane into two regions. One of them, where every point (x, y) satisfies $ax + by \geq c$, is region R. As of now, we do not know what the line looks like and which of the given two regions is region R.

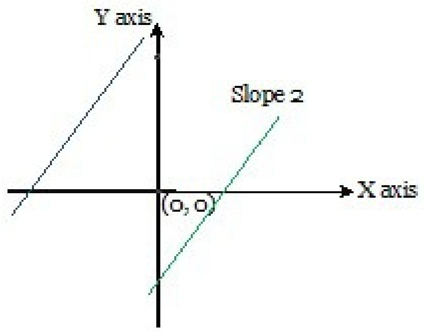


If the line is as shown above, both the regions will have points in the first, second and fourth quadrants but only Region 1 will have points in the third quadrant.



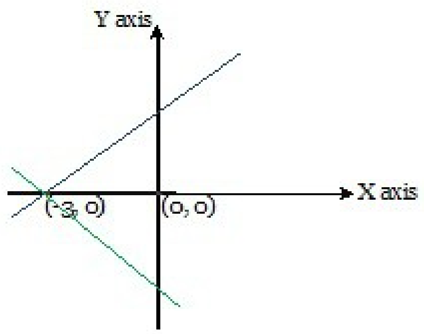
But if the line is as shown in this figure, both the regions will have points in the second, third and fourth quadrants but only Region 2 will have points in the first quadrant. There are many different cases. We see that if a line passes through a particular quadrant, both regions lie in that quadrant. Else, only one of the two regions lies in that quadrant. For example, in the figure above, the line passes through second, third and fourth quadrants and hence, both regions lie in these quadrants. But it doesn't pass through quadrant 1 and hence only Region 2 lies in the first quadrant. Let's go on to the statements now.

Statement 1: Slope of the line represented by ax + by – c = 0 is 2.



If the slope of the line is 2, it will always pass through the third quadrant and hence both regions will have points in the third quadrant. (Note that a line with a positive slope will definitely pass through the first and the third quadrants.) Statement 1 is sufficient alone.

Statement 2: The line passes through (-3, 0).



A line passing through (-3, 0) could be the blue line or the green line. In either case, the line will pass through the third quadrant and hence, will have both regions in the third quadrant. So it is sufficient too? What about the x axis? That is also a line passing through (-3, 0). But it does not pass through the third quadrant. We would need the equation of the line to find out whether our region R lies in the third quadrant. The equation of x axis is $y = 0$. So the required region R is given by $y \geq 0$ i.e. the first and second quadrants. Here region R does not have any points in the third quadrant. Using just the information given in Statement 2, we cannot say whether a point of region R lies in the third quadrant or not. Statement 2 alone is not sufficient.

Since statement 1 alone is sufficient and statement 2 alone is not, answer is (A).