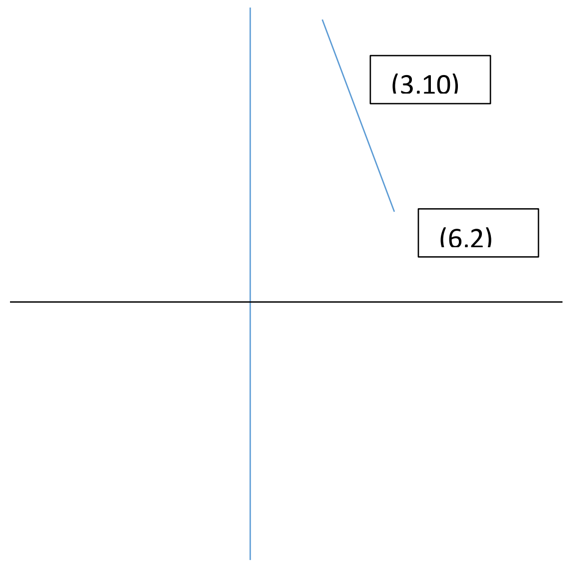
BLA Negative Slope greater than 1 solution with explanation.



We have been given,

(x1,y1)=(3,10)

(x2,y2)=(6,2)

We know,

Slope(m) = y2-y1/x2-x1

= 2-10/6-3

=-8/3

i.e. –ve slope greater than 1.

$P_o = 2\Delta x - \Delta y$(same as +ve slope greater than 1)

$|\Delta x| = 3$

$|\Delta y| = 8$

P_0 = 2*3 – 8 = -2

Or

$\mathbf{P_o = 2\Delta x + \Delta y}$

$\mathbf{\Delta x = 3}$

$\mathbf{\Delta y = -8}$

P_o= 2*3 +(-8) = 6-8 = -2

Since slope is greater than 1 (-ve) so the role of y is fixed i.e. the value of y is decreased by 1 and the value that is altered is x.

To find decision parameter for –ve slope we can use the concept of +ve slope

For example:

For slope < 1 we have $P_o= 2\Delta y - \Delta x$ so for slope > 1 we interchange position of x and y.

So,

For slope >1 (+ve) we have $P_o= 2\Delta x - \Delta y$

(Now lets remind what we have consider over here to have this derivation i.e. $Y_{k+1} = Y_k + 1$ and for $X_{k+1} = X_k$ or $X_k + 1$,

Look at the question and the figure we have same value for X i.e. X is increasing as above we have assume for +ve slope but we can see there is change in Y i.e. it is decreasing where in the first case it was increasing so we need to change the sign of Δy by just compliment sign. i.e. it will be $2\Delta x - (-\Delta y)$ =$2\Delta x + \Delta y$)

Now let's calculate the P_o using the new decision parameter

$P_o=2\Delta x + \Delta y$ = 2*3 – 8 = -2 same as we get using modulo sign …. That was why that modulo sign was used when you refer to other notes BUT I want you guys to derive it and get the knowledge rather than just solve and that was why I was forcing you for extra 1 class to make you clear about all this BLA. Hope you all understood it, if any problem message me or call me.

So everything is as same as that which we have perform earlier for +ve slope greater than 1.

SO FOR CALCULATION YOU CAN USE:

i.e. $P_o = 2|x| - |\Delta y|$ **OR $P_o = 2\Delta x + \Delta y$ (You got it now)**

$P_{k+1} = P_k + 2|\Delta x| - 2|\Delta y|(X_{k+1} - X_k)$ **or $P_{k+1} = P_k + 2\Delta x + 2\Delta y(X_{k+1} - X_k)$ (Got it!!)**

$P_k > 0$ ($X_{k+1} = X_k + 1$)

$P_{k+1} = P_k + 2|\Delta x| - 2|\Delta y|(X_k + 1 - X_k)$

$P_{k+1} = P_k + 2|\Delta x| - 2|\Delta y|$ **or $P_{k+1} = P_k + 2\Delta x + 2\Delta y$**

$P_k < 0$ ($X_{k+1} = X_k$)

$P_{k+1} = P_k + 2|\Delta x| - 2|\Delta y|(X_k - X_k)$

$P_{k+1} = P_k + 2|\Delta x|$ **or (No change here,since we don't have y component)**

Calculation:

$2|\Delta x| - 2|\Delta y| = -10$ and $2|\Delta x| = 6$

OR

$2\Delta x + 2\Delta y$ = 2*3 +(2*-8)=6 -16 = -10 and $2\Delta x = 6$

(Now you can compare the result, using both do not have any difference since their calculation in final have same value)

(Since slope is greater than 1 and you know $Y_{k+1} = Y_k - 1$, we can substitute Y_{k+1} in decreasing order)

K	P_k	X_{k+1}	Y_{k+1}
1	-2**(P_k<0)**	3	9
2	4(P_k>0)	4	8
3	-6**(P_k<0)**	4	7
4	0(P_k>0) (you can assume as **(P_k<0)** and proceed, you will get same resut)	5	6
5	-10**(P_k<0)**	5	5
6	-4**(P_k<0)**	5	4
7	2(P_k>0)	6	3
8	-8**(P_k<0)**	6	2