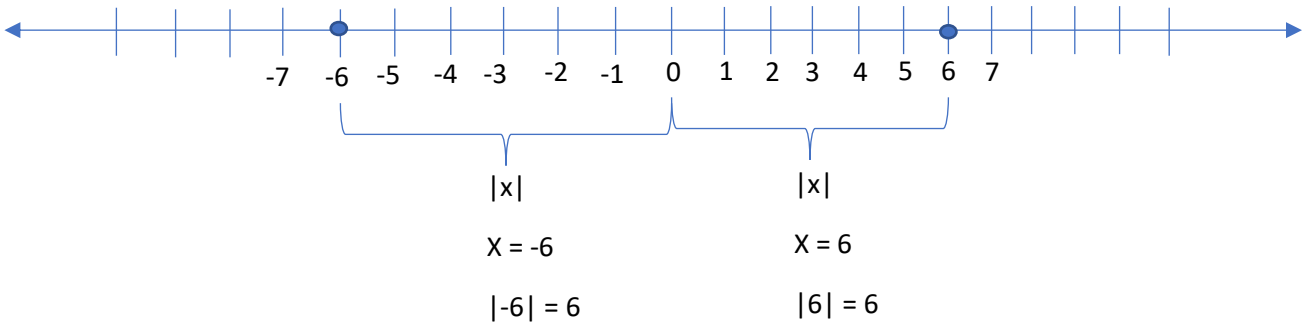
Absolute Value

The absolute value |x| of a real number always produces a non-negative number that means if x is assigned with positive (x>=0) or negative value (x<0), the absolute value of x, |x| is always a non-negative value of x without regard to its sign.

The absolute value of a number is like a distance. We don't tell anyone a distance as a negative value like -10km from a particular starting point. We always say it as a positive value. (like 10km from Malabe). An absolute value is same like that. It is considered as distance from 0 to any number either positive or negative of the number line. Here is an example for you

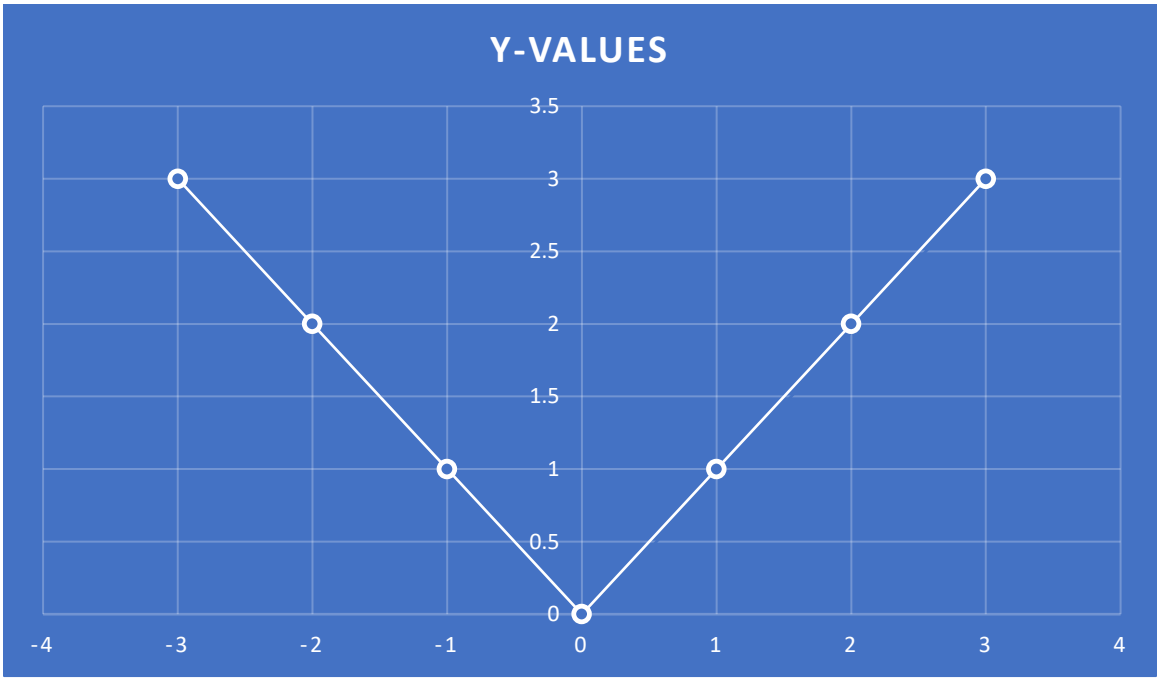


Let’s draw the graph of |x|

Y=|x|

First draw a table to get y coordinates by giving some range of value to x

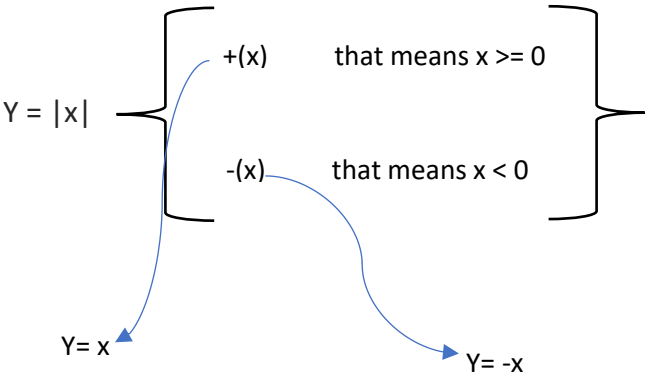
x	-3	-2	-1	0	1	2	3
Y=|x|	3	2	1	0	1	2	3



This method is sufficed for a simple expression like this but for a complicated expression, we can do this using another method. Let's do it

Y = |x|

X can be either positive or negative value and |x| will be definitely a positive number like said before. So, we divide this graph in to two graphs with y= +x and y=-x and draw those graphs in a same cartesian plane.



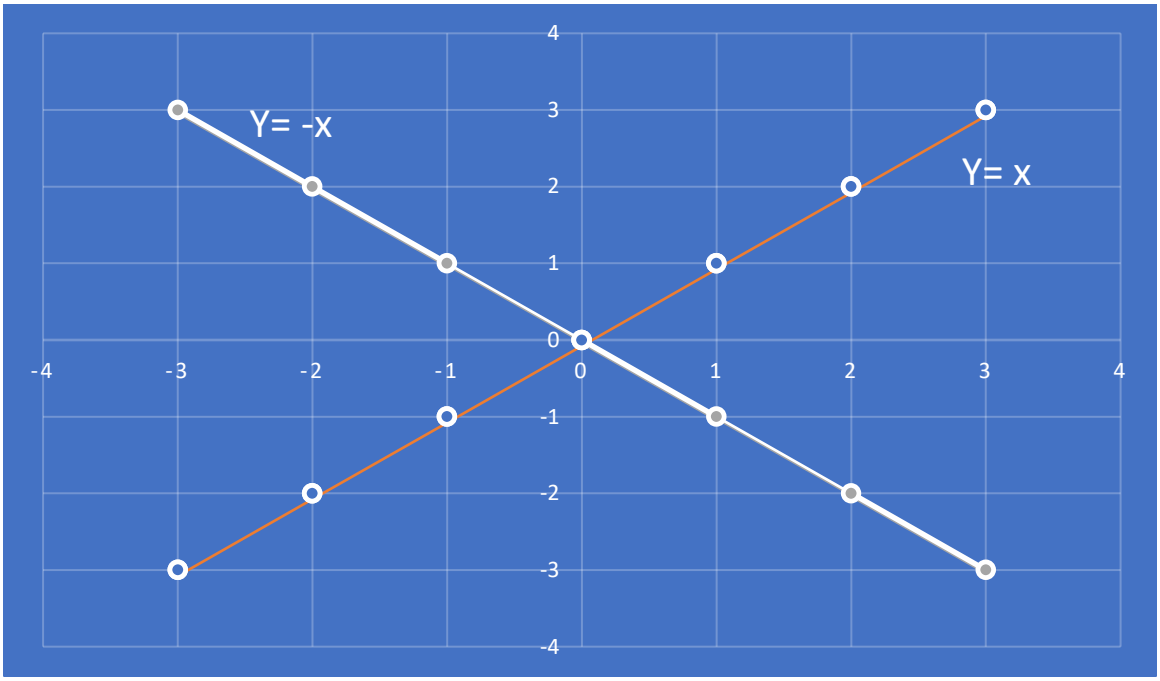
Let's get the y coordinates of graph y = x

x	-3	-2	-1	0	1	2	3
Y = x	-3	-2	-1	0	1	2	3

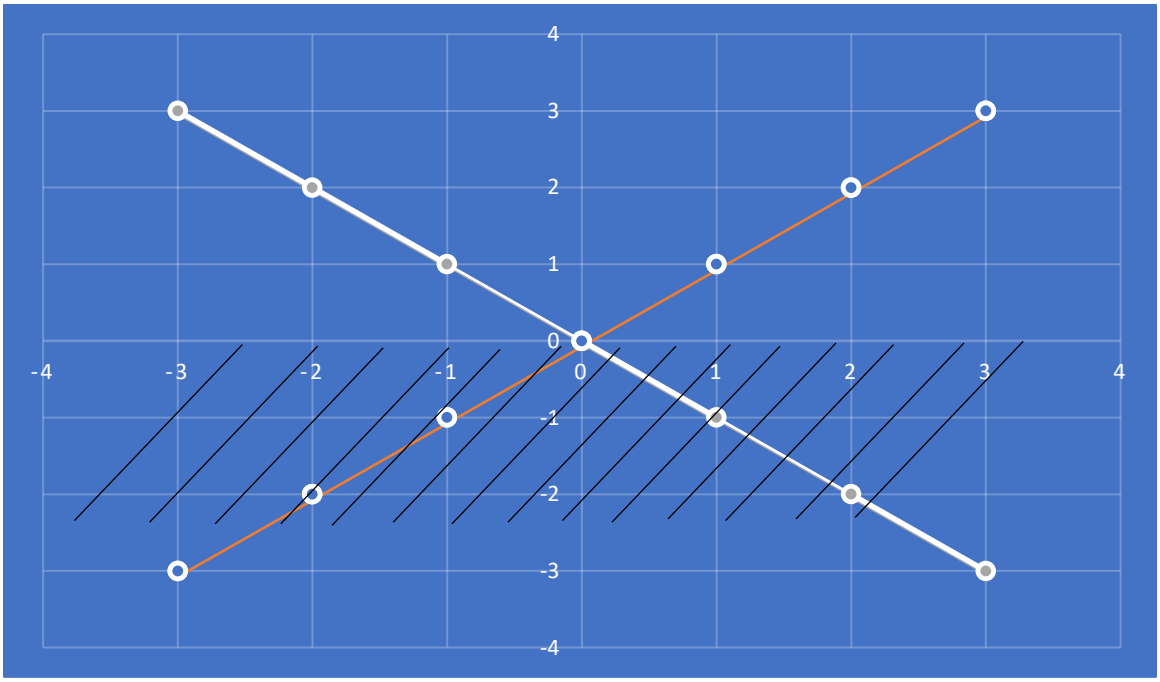
And y coordinates of graph y = -x

x	-3	-2	-1	0	1	2	3
Y = -x	3	2	1	0	-1	-2	-3

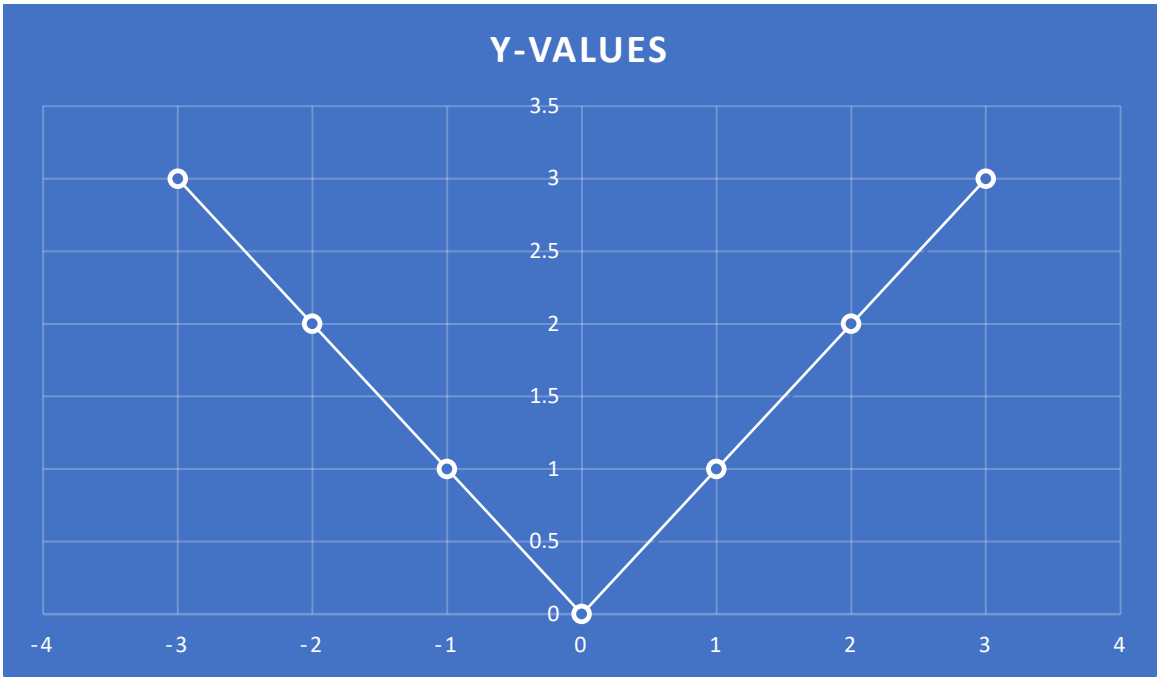
Then draw these two graphs in a one cartesian plane.



In this graph, just think about did we get the correct coordinates for y for y=|x|. This graph includes negative coordinates for y but it couldn't be correct. Because y always must be a positive number due to |x| because absolute value of x, |x| always produces a positive number. So, we have to remove the area of this graph that exceeds from 0 to the negative side of y axis.



Then we get the final graph for y = |x| like below



We get the same graph like we drew using a table in the first place.

That's all about the absolute value and its graph. You can apply this theory in different questions and draw graphs. If you are interested in getting some more questions related to this theory, let me know, I'll put some more questions and answers for you.