

Functions und Graph

Darren Nathaniel Khosma

July 2024

1 Introduction

Man I forgot to bring my notebook. So I'll just be using Overleaf's LaTeX because I know how to use it, I mean good to test and learn this I guess. The graph of the function is the set of all points (x,y) in the plane that satisfies the equation $y=f(x)$ $y = f(x)$.

2 Absolute Value

Absolute value is weird but makes sense, for example for $3x - 2$. By the way, the answer of a absolute value must be positive, or not you break space and time.

$$|3x - 2|$$

Yeah, this really just means $+(3x - 2)$, and $-(3x - 2)$, hence being $3x - 2$ and $-3x + 2$. Drawing the graph is really just the same, just ignore the negative part of the graph.

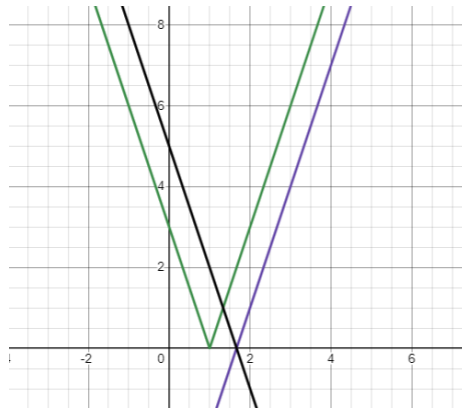


Figure 1: Red Line being the absolute value of $3x - 3$, black being $-3x + 5$, and blue being $3x - 5$

For regular numbers such as 1, 2, 3, 4 the absolute value is just their value, like $|5| = 5$. But for negative numbers it's the positive value of the number $|-5| = 5$.

And for example, if you already got the value of x in $f(x)$ for example

$$|x - 3| + 3$$

Substitute the x from the $f(x)$, so for example $f(5)$, hence it becomes

$$|5 - 3| + 3$$

$$|2| + 3 = 5$$

For inequalities using absolute value it's just if $|x| < a$, then it's

$$-a < x < a$$

And if it's $|x| > a$, then the answer is either

$$x < -a$$

Or,

$$x > a$$

And if it's a function, such as $|x - 1| < 2$, then it's

$$-2 < x - 1 < 2$$

Becoming,

$$-1 < x < 3$$

3 End of the 1st meeting

The first meeting ended, now I will continue this pdf until the chapter ends, so this will be always in WIP.

4 2nd Meeting

The value of absolute value can also be found by doing

$$\sqrt{(f(x))^2}$$

For example,

$$\sqrt{(x - 2)^2}$$

2 answers, like all quadratic questions, that's the answer for the absolute value

$$|x - 6| = |3 - 2x|$$

Going back to the definition of Absolute value where, the positive value is above 0, and negative being below 0, though this one's hard so we use the 2nd method being the one above.

$$\sqrt{(x - 6)^2} = \sqrt{(3 - 2x)^2}$$

$$x^2 - 12x + 36 = 9 - 12x + 4x^2$$

$$3x^2 - 27$$

$$x^2 - 9$$

$$(x - 3)(x + 3)$$

$$x_1 = 3, x_2 = -3$$