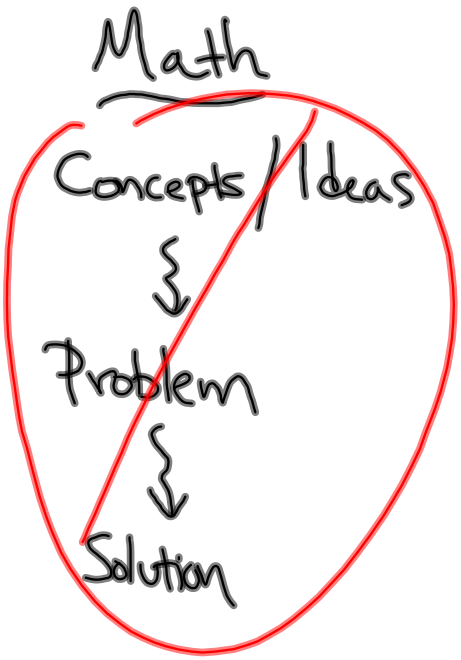


Problem

↓

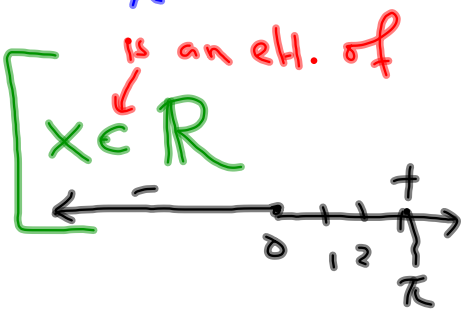
Ideas, concepts.....

↓ ↓ ↓

Solutions

* Definitions are crucial!

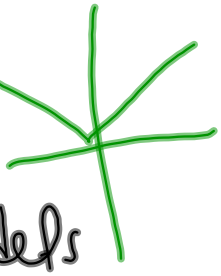
Ex: For a real number x how to define $|x|$?



1) $|x|$ = the dist on # line from x to 0.

2) $$|x| = \begin{cases} x & \text{if } x > 0 \\ -x & \text{if } x < 0 \\ 0 & \text{if } x = 0 \end{cases}$$

William says:



Fact: These defs are log. equiv.

3) $|x| = \sqrt{x^2}$

Some defs are better than others (in certain situations).

Key props of abs val

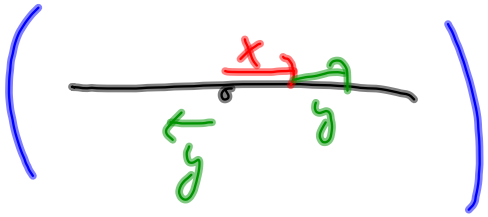
if and only if ⟺

Defs

a) $|x| \geq 0$ and $|x| = 0$ iff $x = 0$. ← 2 (Kim) 1 (Levi)

b) $|xy| = |x| \cdot |y|$ ← Def 3

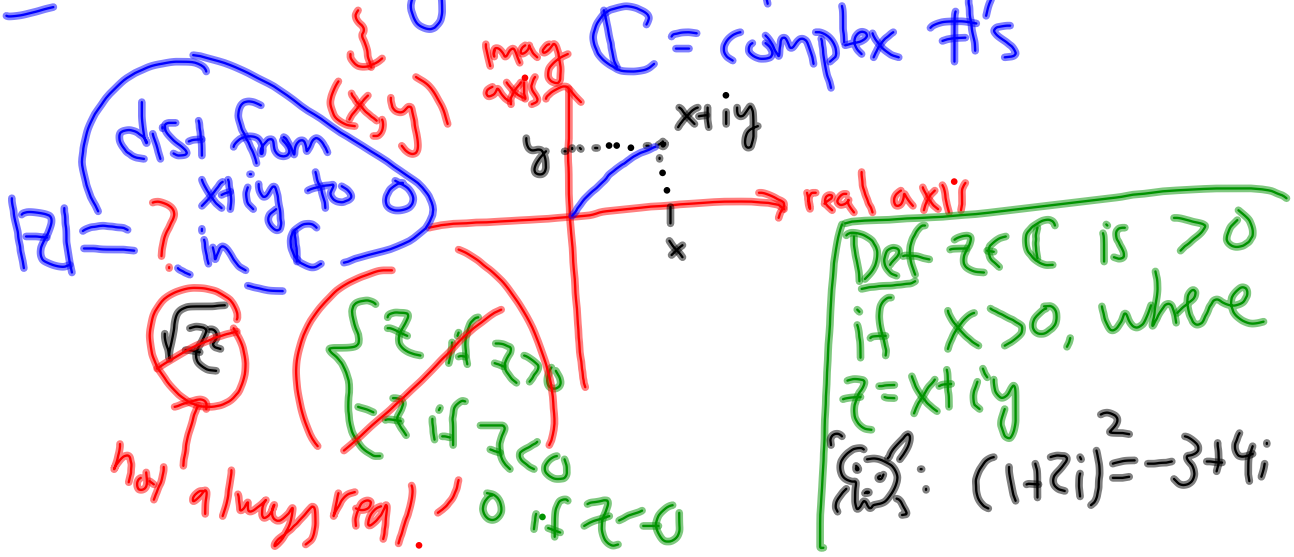
c) $|x+y| \leq |x| + |y|$ ← Def 1.



* The most important thing in making def's: Ability to generalize.

Ex. $z = x+iy$ a complex number

$\mathbb{C}$ = complex #'s



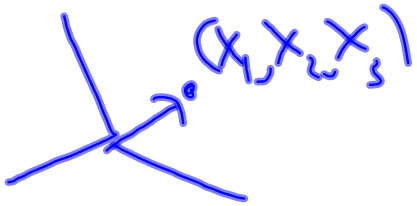
Def $z \in \mathbb{C}$ is >0 if $x>0$, where $z = x+iy$

Ex: $(1+2i)^2 = -3+4i$

In fact: $|x+iy| = \sqrt{x^2+y^2}$

More generally: In Euclidean n-space,

$$|(x_1, x_2, \cdots, x_n)| = (x_1^2 + x_2^2 + \cdots + x_n^2)^{1/2}$$



Problem: A substance is 99% water. Some water evaporates, leaving a substance that is 98% water. How much water evaporated?

What percentage of original water evaporates?