why??????????????????????????

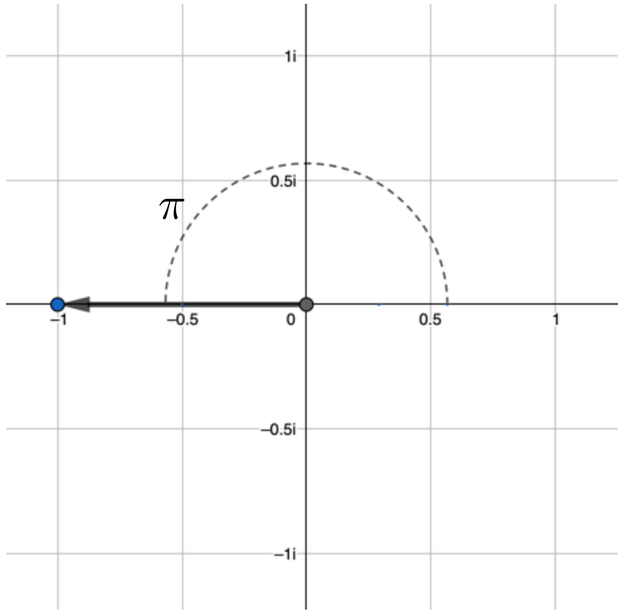
why is euler's identity true?????!!!!??!???!!

ok here is the first hint of why: rewrite it like this

$$e^{\pi i} = -1$$

it doesn't have the elegant beauty of containing both 0 and 1 but we're trying to get to the bottom of things now!

and remember this picture of the complex plane:



hmm. a rotation of π radians in the complex plane puts you at -1. hmmmmm. hmmmmmmmmm.

note: i will not actually be answering the question "why is euler's identity true"

Weirdnesses Left Unaddressed

Hang on though what does $e^{\pi i}$ even mean. Like what does it mean if i is an *exponent*

I'm gonna leave that unanswered because there's no intuitive explanation that I'm aware of! But we can reason about it a bit mathematically:

- it needs to act like other exponents. so for example: $\left(2^i\right)^i = 2^{i \cdot i} = 2^{-1} = \frac{1}{2}$ which is kinda weird but ok?
- it *also* needs to still satisfy $f(z) = e^z \Rightarrow f'(z) = e^z$ cause that's kinda *e*'s whole deal