Complex Analysis

This lecture will be recorded. If you do not want your face in the recording, please turn off your camera. If you do not want your voice in the recording, please participate using the chat.

No exam in this class at all.

Instead, next week we'll have Redo week 1

TOMORROW OR FRIDAY I will post Redo HW 1

Next week: Redo HW + Metacognition only

longer ~ 8-10 new problems

+ more repeat problems from previous HWs

Idea:

Undergraduate credit: do as many OR as few problems as you want to improve your objective scores

Graduate credit: required to attempt all new problems, you may also do repeat problems to increase your scores

Redo week logistics

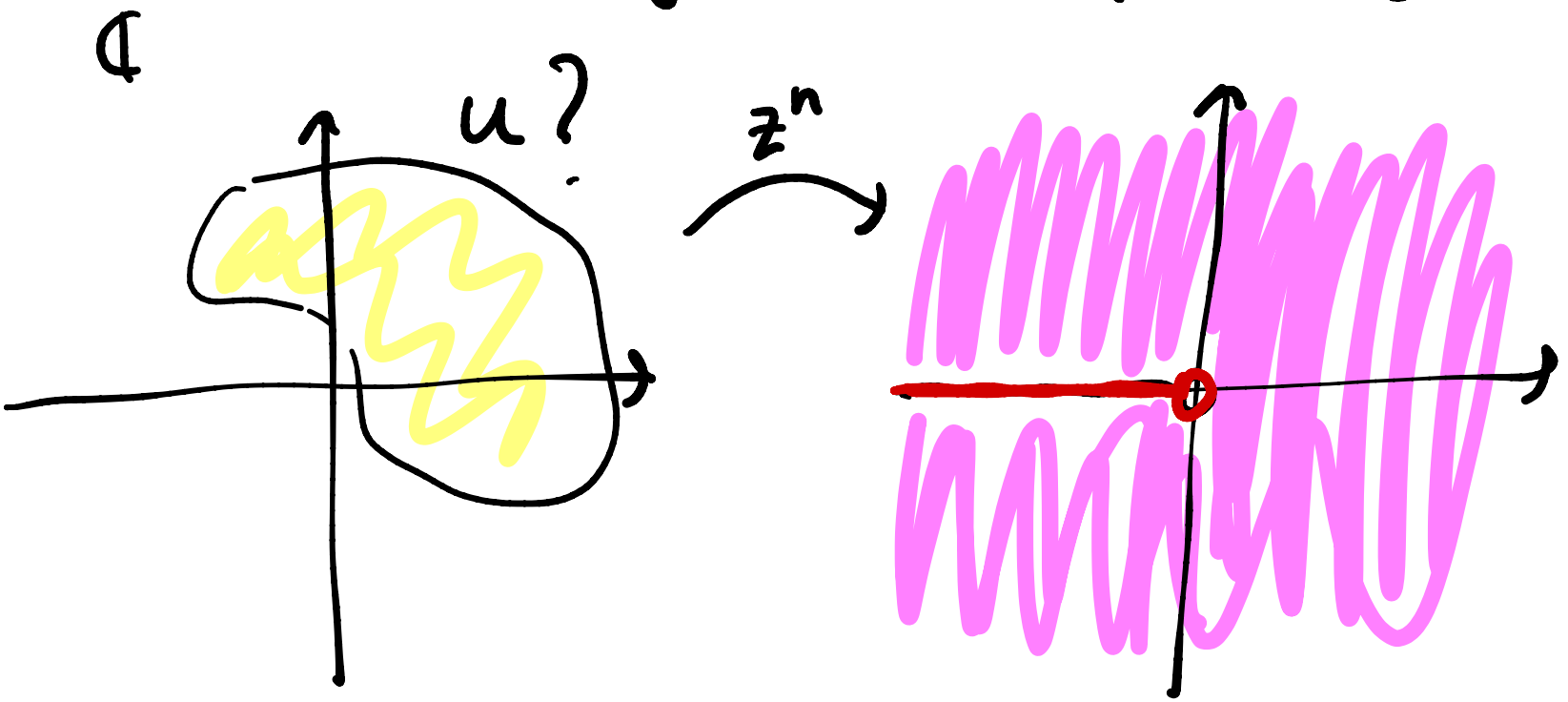
Monday, Wednesday, Friday will all be open for questions

3 due dates: Monday, Wednesday, Friday 11:59pm

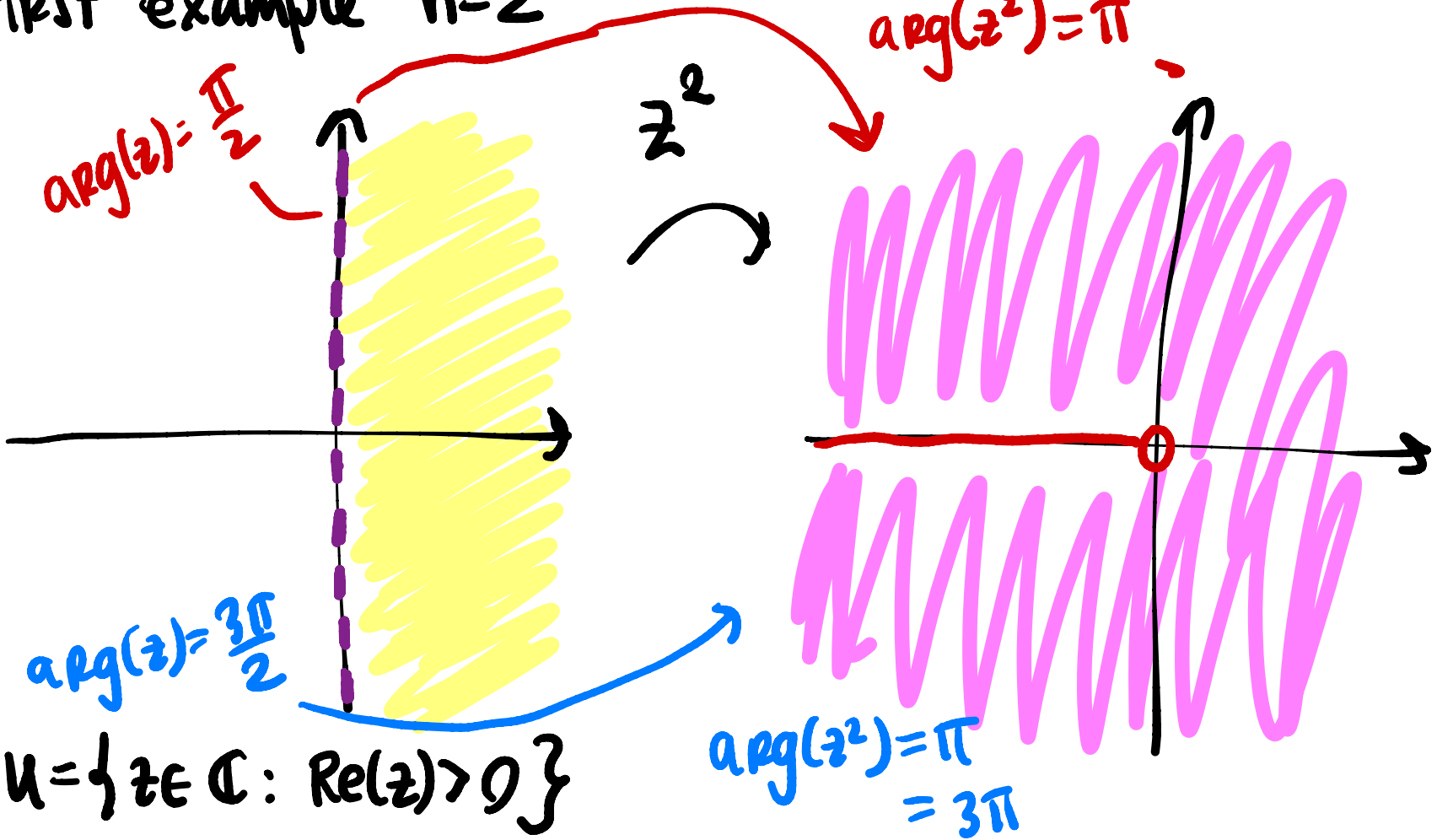
Have HW3,4 graded tonight

HW5 #1d) $U \subseteq \mathbb{C}$ $f(z) = z^n$ $n > 0$ $n \in \mathbb{Z}$

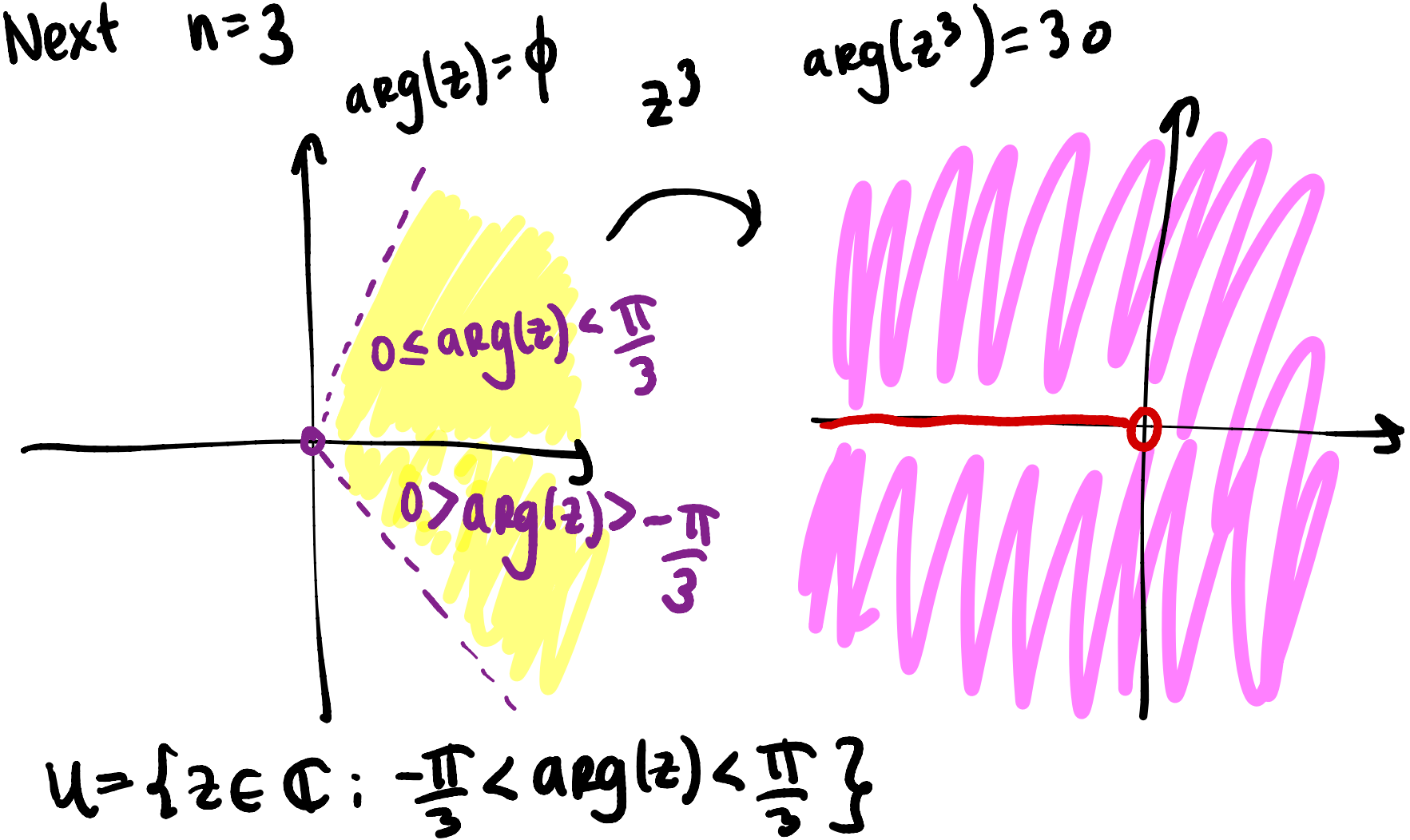
Image covers $\mathbb{C} - (\{0\} \cup \{\text{neg real axis}\})$



First example $n=2$

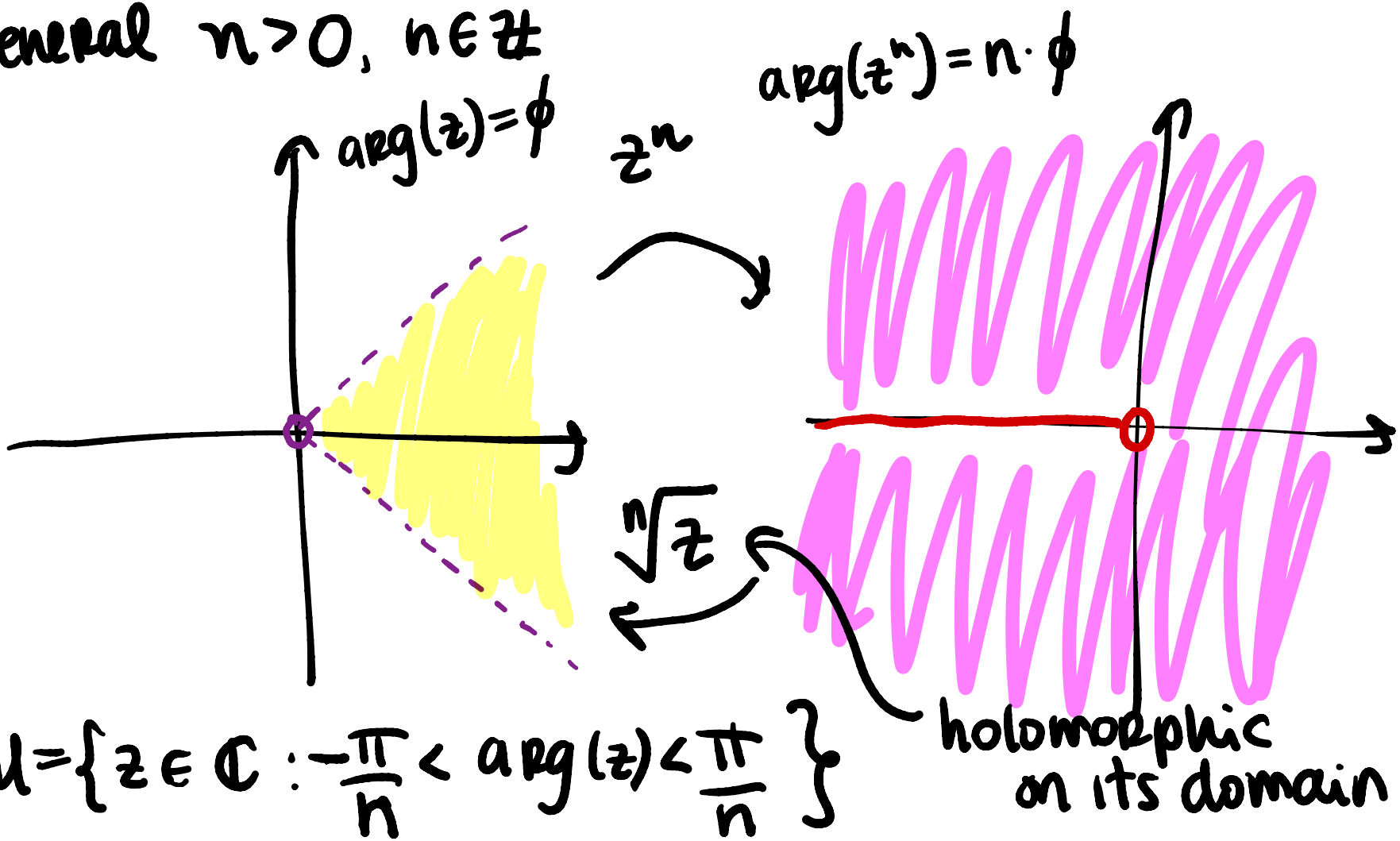


Next $n=3$



$$U = \{ z \in \mathbb{C} : -\frac{\pi}{3} < \arg(z) < \frac{\pi}{3} \}$$

General $n>0$, $n\in\mathbb{N}$



$$U=\left\{z\in\mathbb{C}:-\frac{\pi}{n}<\arg(z)<\frac{\pi}{n}\right\}$$

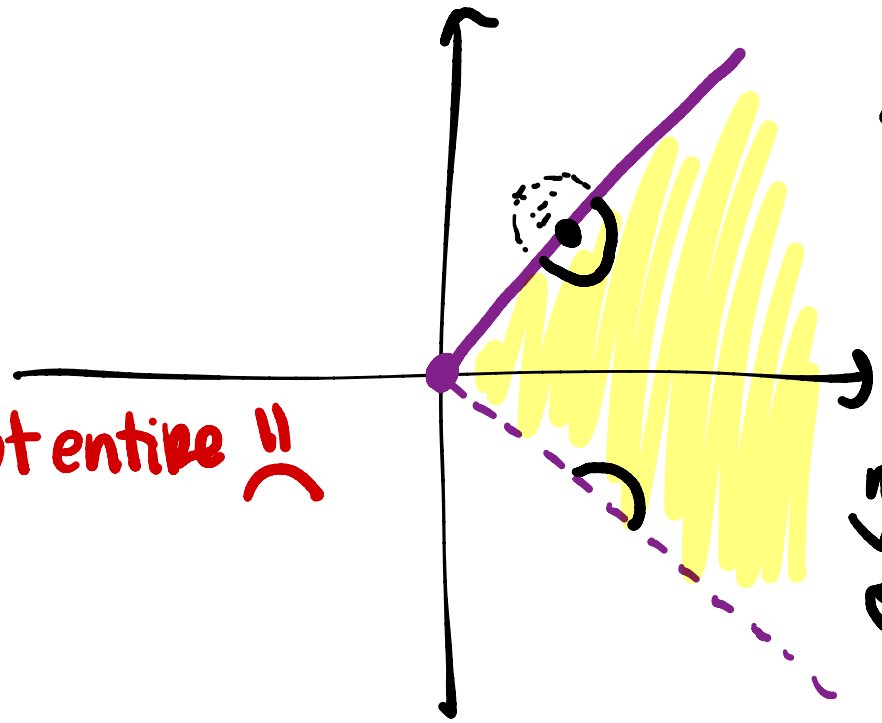
$$U = \{ z \in \mathbb{C} : -\frac{\pi}{n} < \arg(z) \leq \frac{\pi}{n} \}$$

If you include $\arg(z) = \frac{\pi}{n}$

$\downarrow$

$\arg(z^n) = \pi$ $\rightarrow$ neg real axis

What if?



not entire !!

z^n

$\sqrt[n]{z}$

subjective yay!

$$A = \{ z \in \mathbb{C} : \frac{-\pi}{n} < \arg(z) \leq \frac{\pi}{n} \}$$

principal nth root function

HW5 #5 → Friday

Notation

$$\text{Log}(z) = \ln|z| + i\,\text{Arg}(z)$$

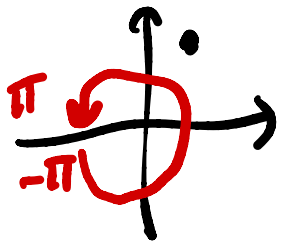
$$\log(z) = \ln|z| + i\,\arg(z)$$

} branch of the "inverse" of $\exp(z)$

ln Real function that is the inverse of e^x

Arg(z) = principal branch of arg(z)

outputs in the set $(-\pi, \pi]$



arg(z) = { all angles associated to z }

↖ multivalued

$\sqrt{4} = 2$ = Squareroot(4) "principal branch"

OR = squareroot(4)

$\sqrt{4} = \{2, -2\}$ multivalued function

That's all for today!

Today OH 4pm-5pm