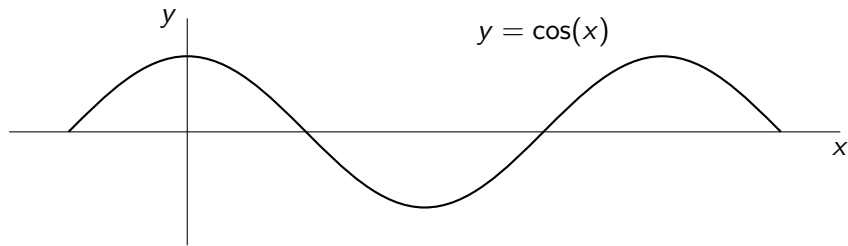# Reminders on inverse functions

The cosine function is not one-to-one (injective), so no inverse function is defined unless the domain is restricted. The usual choice is to restrict the domain to the interval $[0, \pi]$.

The complex square-root function

The squaring function $z \mapsto z^2$ is not one-to-one.
One possible way to restrict the domain to get a one-to-one
function is $\mathrm{Im}(z) > 0$. With this restriction, z^2 takes values that
fill out the image plane with the exception of the positive real axis.
With this restriction, $\sqrt{i}$ would be $e^{i\pi/4}$ and $\sqrt{-i}$ would be $e^{3\pi i/4}$.

On the other hand, we could restrict the domain of z^2 to be
$\mathrm{Re}(z) > 0$.
With this choice, $\sqrt{i}$ would still be $e^{i\pi/4}$, but $\sqrt{-i}$ would be $e^{-i\pi/4}$.

Assignment due next class

- Section I.5: Exercise 2(a),(b)