18.112 Functions of a Complex Variable

Fall 2008

Lecture 5: Exponentials and Trigonometric Functions

(Text 42-47)

Remarks on Lecture 5

Since $\cos z$ is even, $\arccos z$ can just as well defined as

$$\arccos z = -i \log(z + \sqrt{z^2 - 1}).$$

This in fact more appropriate because then the derivative is

$$-\frac{1}{\sqrt{1 - z^2}},$$

which is better because then the derivative is < 0 for $z = 0$.

Note that in any case

$$\cos(\arccos z) = z,$$

since $z + \sqrt{z^2 - 1}$ and $z - \sqrt{z^2 - 1}$ are reciprocals.