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Functions of a Complex Variable.

In the same way that we have functions of a real variable, we can have functions of a complex variable.

As $z = x + iy$ $\quad x, y \in \mathbb{R}$

$i = \sqrt{-1}$

z involves the imaginary unit i.

then we can have i included in the function defination.

Eg

$$f(z) = \frac{ie^{iz}}{(z^2 - 2iz)^2}$$

Note 1 : All complex expressions can be expressed in the form

$$u(x,y) + i\,v(x,y)$$

i.e. a real function plus i times another real function

(Recall, we said that numerical complex expressions can be written as

$x + iy \quad x, y \in \mathbb{R}$)