Contents

0.1 Cauchy-Riemann equations

Consider complex number z=x+iy

A function on this gives:

$f(z) = u + iv$

Take the total differential of :

$df/dz = \frac{\delta f}{\delta z} + \frac{\delta f}{\delta x}\frac{dx}{dz} + \frac{\delta f}{\delta y}\frac{dy}{dz}$

We know that:

- $\frac{dx}{dz} = 1$
- $\frac{dy}{dz} = -i$

We can see from this that

- $\frac{du}{dx} = \frac{dv}{dy}$
- $\frac{du}{dy} = -\frac{dv}{dx}$

These are the Cauchy-Riemann equations