Formula Sheet EE2M11

MaybE_Tree

2022-09-07

Principal Argument	$-\pi < \theta \leq \pi$	
Triangle Inequality	$\begin{cases} \lvert z_1 \pm z_2 \rvert \leq \lvert z_1 \rvert + \lvert z_2 \rvert \\ \lvert z_1 \pm z_2 \rvert \geq \lvert z_1 \rvert - \lvert z_2 \rvert \end{cases}$	
Limits to Infinity	$\begin{cases} \lim\limits_{z \to z_0} f(z) = \infty \iff \lim\limits_{z \to z_0} \dfrac{1}{f(z)} = 0 \\ \lim\limits_{z \to \infty} f(z) = L \iff \lim\limits_{z \to 0} f\left(\dfrac{1}{z}\right) = L \end{cases}$	*L must be finite, maybe??*
Cauchy-Riemann	CR1 u v x $\dfrac{du}{dx}$ $\dfrac{dv}{dx}$ y $\dfrac{du}{dy}$ $\dfrac{dv}{dy}$	*For* $f(x,y) = u(x+y) + iv(x,y)$
Harmonic Check	$\dfrac{\delta^2 u}{\delta x^2} + \dfrac{\delta^2 u}{\delta y^2} = 0 \implies \dfrac{\iint\limits_D f(z)}{\text{Area}(D)} = f(z_c)$	*For* $f(x,y) = u(x+y) + iv(x,y)$ *Around a circular domain D with centerpointn* z_c
Exponential Function	$e^z = e^x(\cos y + i \sin y)$	
Trig Functions	$\begin{cases} \sin z = \dfrac{1}{2i}(e^{iz} - e^{-iz}) \\ \cos z = \dfrac{1}{2}(e^{iz} + e^{-iz}) \end{cases}$	*All the familiar identities apply, but range is no longer* ± 1 *.*
Cauchy's Formula	$\dfrac{2\pi i}{n!} f^n(z_0) = \int\limits_C \dfrac{f(z)}{(z - z_0)^{n+1}}$	*For* $n = 0, 1, 2, ...$
Parama	$\int\limits_C f(z)dz = \int\limits_a^b f(z(t))z'(t)dt$	

	0	$1/6\pi$	$1/4\pi$	$1/3\pi$	$1/2\pi$
sin	0	$1/2$	$\sqrt{2}/2$	$\sqrt{3}/2$	1
cos	1	$\sqrt{3}/2$	$\sqrt{2}/2$	$1/2$	0
tan	0	$\sqrt{3}/3$	1	$\sqrt{3}$	???