Complex functions

(1)   z+b translation

(2)   cz   rotation and scaling

(3)   1/z   reciprocation

(4) $w = \dfrac{az+b}{cz+d}$ bilinear mapping

Limit

$$\lim_{x \to x_0} f(x) = L_R \;\; 左右兩邊 \;\; \text{real}$$

$$|f(x) - L_R| < \varepsilon \; whenever \; |x - x_0| < \delta$$

$$\lim_{z \to z_0} f(z) = L_C \;\;\; 四面八方 \;\; \text{complex}$$

$$|f(z) - L_c| < \varepsilon \; whenever \; |z - z_0| < \delta$$

$$\lim_{z \to 0} \frac{\operatorname{Re}(z^2)}{|z|^2} = ?$$

Continuity

$$\lim_{x \to x_0} f(x) = f(x_0) \;\; \text{real}$$

$$\lim_{z \to z_0} f(z) = f(z_0) \;\; \text{complex}$$

Open set closed set

Cauchy-Riemann equation (Cartesian and polar) and directional

derivative

Laplace equation   exact form stream line and potential line

Orthogonal trajectory   harmonic function   Reflection principle $\overline{f(z)} = f(\bar{z})$

Limit-continuous-function.doc Chen 製表   2006 Fall