Re: visualization of f: C −> C

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"Sukjah Roh"
> *Hi*
>
> *I am sorry that I am not good at english.*
> *I am wondering how most mathematicians and some famous mathematicians*
> *visualize functions from C to C. (where C is the complex plane.)*
>
> *To make pictures in my mind, of functions of type R −> R, R−>R^2,*
> *R^2−>R, I imagine the graph of the functions. (the graph of a function*
> *R−>R is in R^2, the graph of a function: R^2−> R is in R^3, etc)*
>
> *When it comes to functions of type C−>C, the graph is in R^4 the 4*
> *dimensional space. so it is difficult to imagine the graph.*

An analytic function is _conformal_ (meaning it preserves angles) wherever its derivative is nonzero. Therefore it maps circles into circles, in the sense that a line is a special kind of circle. This provides a way to diagram complex functions by a sort of coordinate system, consisting of two families of perpendicular curves. Lars Ahlfors has a pretty good account of this topic in his book "Complex Analysis".
LH