Tutorial 2. 21 Sep 2015.

1 Review of some elementary functions.

a> $f(z) = \frac{z}{2}$. $D = \{z \mid Im\, z > 1\}$

b> $f(z) = iz + (3+4i)$. $D = \{z \mid |z| \leq 1\}$

c> $f(z) = \frac{z+2i}{3z+4}$ $D = \{z \neq \mathbb{R}\}$ (Möbius Transformation.

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2. Find a Möbius Transformation f s.t. f maps D_1 onto D_2.

a> $D_1 = \{z \mid |z| \leq 1\}$. $D_2 = \{z \mid |z-1-i| \leq 2\}$

b> $D_1 = \{z \mid |z| \leq 1\}$. $D_2 = \{z \mid |z-1-i| \geq 2\}$

c)* $D_1 = \{z \mid |z| \leq 1\}$. $D_2 = \{z \mid Im\, z \geq 0\}$

Hint: Implicit form.

a> $f(z) = zz + 1+i$

b) $f(z) = \frac{2}{z} + 1+i = \frac{z + (1+i)z}{z}$

c)* $f(z) = \frac{z-1}{z+1}\,\frac{i+1}{i-1}$.

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3. Find a real part for the following differentiable fuction $f(z) = u+iv$ for $z = x+iy \in \mathbb{C}$

a) $v = e^{2x}\sin 2y$ b> $v = 2xy$

Hint: a>. e^{2z} b> z^2

~~Candy~~-Riemann Equation.