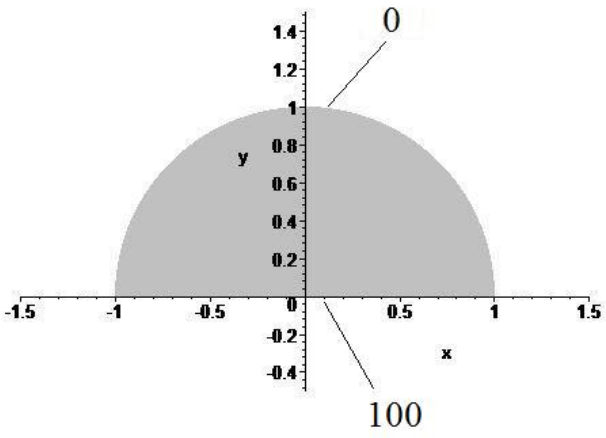
Math 519 Homework 3

Directions: NEATLY write all solutions on your own paper. Solutions should include details like integration by parts and reasons for convergence or divergence.

1) Find where the map $f(z) = \left(\frac{1+z}{1-z}\right)^2$ sends the upper half of the unit disk.



2) Solve the Dirichlet problem if the temperature on the circle is $0°$ and $100°$ on the x axis. Plot the level curves for T=20,40,60,80.

3) Find Greens function for the region. Set up the integral form of the solution using

$$u(x,y) = \frac{1}{2\pi}\int_{\Gamma} u(x,y)\frac{\partial G}{\partial n}(r,t,x,y)\,ds$$