MATH 418 COMPLEX VARIABLES
Homework 8 Solution

Due March 27, 2001

Note: If you have any questions about the solution, or you think there are some typos/errors in the solution, please e-mail me. I'll double-check it and then reply to you. Thank you.

C17. Solution:

$$F(z) = \frac{x^2+y^2-1}{(x+1)^2+y^2} + \frac{2yi}{(x+1)^2+y^2}$$

$$\phi(x,y) = \frac{x^2+y^2-1}{(x+1)^2+y^2}, \psi(x,y) = \frac{2y}{(x+1)^2+y^2}$$

The streamlines are described by the equation: $C = \frac{2y}{(x+1)^2+y^2}$.
If $C = 0$, the streamline is the straightline $y = 0$. If $C \neq 0$, the streamlines are circles centered at $(-1, 1/C)$ with radius $1/|C|(C \neq 0)$: $(y-1/C)+(x+1)^2 = 1/C^2$.