Math 526 **Homework 5** **Due Oct. 3, 2007**
Grady Wright

1. Book problems:
   2.5: 1e, 2b, 6
   2.6: 1e, 2d

2. Find a branch cut for the function $f(z) = (z^2+1)^{\frac{1}{2}}$ using the principal angles:

   (a) $-\dfrac{\pi}{2} \le \theta_1, \theta_2 < \dfrac{3\pi}{2}$

   (b) $-\dfrac{\pi}{2} \le \theta_1 < \dfrac{3\pi}{2}$ and $-\dfrac{3\pi}{2} \le \theta_2 < \dfrac{\pi}{2}$

3. Find the solution of Laplace's equation $\psi_{xx} + \psi_{yy} = 0$ for $-\infty < x < \infty$ and $y > 0$, with boundary conditions:

$$\psi(x,0) = \begin{cases} 4 & \text{for } x < -2 \\ 3 & \text{for } -2 < x < -1 \\ 2 & \text{for } -1 < x < 1 \\ 1 & \text{for } 1 < x < 2 \\ 0 & \text{for } 2 < x \end{cases}$$