Short Exam 6 Name:_____

Physics 403: Mathematical Methods April 28, 2008

Complete this quiz showing all work.

1. Let $f(x)$ have a period of 6 and be defined by

$$f(x) = \begin{cases} 0 & 0 < x < 3 \\ 1 & 3 < x < 6 \end{cases}$$

Graph $f(x)$. From the graph determine if the function is even, odd, or neither. Use this to explain whether the a_n are zero. Compute the b_n only. (Refer to page 182.)

2. Compute the Fourier transform of the function

$$f(x) = \begin{cases} \frac{1}{2} & -1 < x < 1 \\ 0 & elsewhere \end{cases}$$

3. Solve

$$\frac{\partial u}{\partial x} = 2u - \frac{\partial u}{\partial y}$$

subject to $u(0, y) = -2e^{2y}$.