Partial Differential Equations
Spring 2014

Assignment 3.1
Due February 4

Exercise 1. Textbook exercise 3.4.2

Exercise 2. Textbook exercise 3.4.4

Exercise 3. Textbook exercise 3.4.14a

Exercise 4. Textbook exercise 3.4.15

Exercise 5. Let $g(x)$ be a function defined on the interval $[0, L]$ and let $G(x)$ be an antiderivative of the $2L$-periodic odd extension $g^*(x)$. Prove that $G(x)$ is an even function. [*Suggestion:* Use FTOC to evaluate $G(x) - G(-x)$.]

Exercise 6. Show that the solution to the vibrating string problem satisfies

$$u(L - x, t + L/c) = -u(x, t)$$

for all $0 \leq x \leq L$ and $t \geq 0$. This shows that after one-half of its period of oscillation, the string always assumes the "opposite" shape. [*Suggestion:* Use expression (6) in the textbook and the preceding exercise.]