PARTIAL DIFFERENTIAL EQUATIONS
SPRING 2015

ASSIGNMENT 6.2
DUE FEBRUARY 26

Exercise 1. Textbook exercise 3.3.4a [*Remark*: This problem requires *no* integration.]

Exercise 2. Textbook exercise 3.3.6 [*Remarks*: You can use an existing series to find the initial velocity portion of the solution. For part (b), use Maple to create an animation of the solution, and upload it to TLEARN.]

Exercise 3. Textbook exercise 3.3.8a

Exercise 4. Textbook exercise 3.3.9a [*Remark*: You can use an existing series to find the initial shape portion of the solution. The initial velocity portion requires *no* integration.]

Exercise 5. Textbook exercise 3.3.11c

Exercise 6. Show that the solution to the (length L, fixed endpoint) vibrating string problem with initial data $u(x, 0) = f(x)$ and $u_t(x, 0) = 0$ is given by

$$u(x, t) = \frac{f_{\text{odd}}(x + ct) + f_{\text{odd}}(x - ct)}{2},$$

where f_{odd} denotes the odd $2L$-periodic extension of f. [*Suggestion:* Make use of the identity $2 \sin A \cos B = \sin(A + B) + \sin(A - B)$ in the series form of the solution.]