18.152: Fall 2010
Homework 8

Available	Tuesday, November 16	Due	Tuesday, November 23

Turn in the homework at the beginning of class on Tuesday, November 23. No late homework is accepted unless previously arranged with the instructor.
This week homework will cover old material and new material from page 244–249 and 261–266.

1. Consider the problem

$$\begin{cases} u_{tt} - c^2 u_{xx} = 0 & 0 < x < L,\ t > 0 \\ u(x,0) = g(x), \quad u_t(x,0) = 0 & 0 \le x \le L, \\ u_x(0,t) = u_x(L,t) = 0 & t \ge 0, \end{cases}$$

where g is a smooth function.

(a) Extend in an appropriate way the initial datum g outside the interval $[0, L]$ and use the d'Alambert formula to represent the solution as superposition of progressive waves.

(b) Comment on the physical meaning of the result.

2. Problem 5.5 in textbook.

3. Problem 5.6 in textbook.

4. Problem 5.8 in textbook.