

MATH 333: Partial Differential Equations  
Project 3, Due Date: Fri., Sept. 29, 2006

Solve the following problem using Laplace transforms.

$$\begin{aligned}u_{tt} &= c^2 u_{xx} - g, & x > 0, & t > 0, \\u(0, t) &= 0, & t > 0, \\u(x, 0) &= 0, & x > 0, \\u_t(x, 0) &= 0, & x > 0.\end{aligned}$$

According to my source for this problem, “the solution shows what happens to a falling cable lying on a table that is suddenly removed.” Here  $g$  is the acceleration due to gravity. Taking  $c = 1$ , draw some time snapshots of the solution.