Math 493, Summer 2009 Sander

Homework 4a

This homework problem is due on Thursday, June 18, the day of the final.

Use separation of variables to find a solution to the Laplace's equation.

$$\begin{aligned} u_{xx} + u_{yy} &= 0 \text{ on } (0,a) \times (0,b) \\ u(0,y) &= 0, \\ u(a,y) &= 0, \\ u(x,0) &= 0, \\ \text{and } u_y(x,b) &= f(x). \end{aligned}$$

Solve this in general, and write a specific solution when $f(x) = x$.