MATH 131P: PARTIAL DIFFERENTIAL EQUATIONS
(WINTER 2019)

Homework 9: due Wednesday, March 13
(This is the last assignment.)

- Lesson 27: 1, 2, 3.
- Lesson 33: 3, 5, 6, 7, 8.
- Lesson 34: 1.

Additional problem:

(1) Consider the Neumann problem of the Laplace equation on the rectangle

$$u_{xx} + u_{yy} = 0, \quad 0 < x < a, 0 < y < b$$
$$u_x(0, y) = 0, \quad u_x(a, y) = f(y), \quad 0 < y < b$$
$$u_y(x, 0) = 0, \quad u_y(x, b) = 0, \quad 0 \le x \le a.$$

Find the solution using separation of variables. From the solution, deduce that if the solution exists, it is necessary that

$$\int_0^b f(y)dy = 0.$$