

**Mathematics 3271 3.0**  
**Fall 2017**  
**Assignment 1**

1. Section 14 in Weinberger: 1(a)
2. Let  $f$  be a nonzero continuous function on the boundary  $\partial D$  of the square  $D = \{(x, y) \in \mathbb{R}^2 : 0 \leq x, y \leq \pi\}$  such that  $f$  is equal to 0 at the four vertices. Find a continuous solution  $u$  on  $D$  of the Dirichlet problem

$$\begin{cases} \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0, & (x, y) \in \{(x, y) \in \mathbb{R}^2 : 0 < x, y < \pi\} \\ u(x, y) = f(x, y), & (x, y) \in \partial D. \end{cases}$$

3. Section 15 in Weinberger: 1, 3, 5