

Math 322 Homework 11

Due Wednesday Dec. 14, 2016

1. (a) Use the method of images to solve

$$\nabla^2 u(\mathbf{x}) = f(\mathbf{x}) \tag{1a}$$

in a semi-infinite 2D domain with boundary condition $u(x, 0) = h(x)$.

- (b) Use the method of images to solve

$$\nabla^2 u(\mathbf{x}) = f(\mathbf{x}) \tag{1b}$$

in a semi-infinite 2D domain with boundary condition $\partial u(x, 0)/\partial y = h(x)$.

- (c) (a) Use the method of images to solve

$$\nabla^2 u(\mathbf{x}) = f(\mathbf{x}) \tag{1c}$$

in a semi-infinite 3D domain with boundary condition $\partial u(x, 0, z)/\partial y = h(x, z)$.

2. Using the method of images, solve

$$\nabla^2 u(\mathbf{x}) = f(\mathbf{x}) \tag{2}$$

in the 2D domain $x \geq 0, y \geq 0$ with boundary conditions $u(0, y) = g(y)$ and $u(x, 0) = h(x)$.