1. Find the Green’s function for the tilted half-space

\[ D = \{(x, y, z) : ax + by + cz > 0\}. \]

[Hint: Use the Green’s function for the halfspace \{z > 0\} and a change of variables.]

2. Find the Green’s function for the half ball

\[ D = \{(x, y, z) : x^2 + y^2 + z^2 < a^2 \text{ and } z > 0\}. \]

[Hint: Reflect the solution for the whole ball across the plane \(z = 0\).]

3. Consider the two dimensional disk

\[ D = \{(x, y) : x^2 + y^2 < a^2\}. \]

Show that the Green’s function for the disk is

\[ G(x, x_0) = \frac{1}{2\pi} \log(\|x - x_0\|) - \frac{1}{2\pi} \log \left( \frac{\|x_0\|}{a} \|x - x_0^*\| \right). \]

where \(x_0^* = \frac{a^2 x_0}{\|x_0\|^2}\).

4. Use problem 3 to recover the two dimensional version of Poisson’s formula for the ball that we derived in class using separation of variables.