

PHYS 240 homework #19 – due Apr 16 2013, 5:25pm, upload to Canvas

Analytic solution to Laplace equation

1. Find the solution to the more general boundary value problem,

$$\begin{array}{llll} \Phi(x=0, y) & = & \Phi_1 & \Phi(x=L_x, y) & = & \Phi_2 \\ \Phi(x, y=0) & = & \Phi_3 & \Phi(x, y=L_y) & = & \Phi_4 \end{array}$$

where Φ_1, \dots, Φ_4 are constants. *Hint:* consider linear combinations of the problem we saw in class. (b) Write a program to graph your solution by mesh and contour plots. Graph the potential for $\Phi_1 = \Phi_3 = 1$, $\Phi_2 = \Phi_4 = 0$, and for $\Phi_1 = \Phi_2 = 1$, $\Phi_3 = \Phi_4 = 0$.

2. Include any discussion and plots in a report generated in L^AT_EX and submitted in PDF format. Also submit your Python code separately.