

Homework 6  
Due October 16, 2009

272:

1.- Textbook problem 24.76

2.- Textbook problem 24.84

272H (the previous two and the following one):

3.- Solve Laplace's equation approximately, using the relaxation method that we talked in the honors section. A harmonic function (solution to Laplace's equation) is such that the average around a point it is equal to the value at the point. The geometry to solve is in the picture, with the interior square (3 cm per side) at a potential of 100 V and the exterior square at a potential of 0 V (9 cm). Start with a grid of 10 points on the side and find a solution that does not change by more than 1% per iteration. This is a rather coarse array and you are welcomed to increase it, but you have to calculate this. You can guess a first set of interior values and then "relax" them through iteration. If you guess too high, you will see that the excess diffuses rapidly away.

