

**Assignment 1**  
**Math 512 - Fall 2005**  
**Prof. J. A. Pelesko**

**A Computational Exercise - How close are we?** Consider the following experiment: Find the distance between two points chosen at random from the interior of a disk of diameter  $d$ . By random, assume the points are chosen independently from a uniform distribution. Repeat the experiment several times and compute the average distance between points. This average depends in some manner on the diameter of the disk,  $d$ . Your job is to uncover this functional relationship by computing the average for a range of  $d$ . In particular, you should study *large*  $d$ . What happens when  $d = 50$ ? 500? 5000? (Note, just because you are computing, you are not prohibited from thinking about the problem from other points of view.) You must hand in a summary of your results typeset using Latex. You should include any graphs or figures within the body of the document. You should write a discussion of your results and thoughts about the question. The writing style should be that of a standard journal article.