Turn in your solution to at least two of the problems. **Explain your solution in full sentences. Give detailed reasonings.** Include diagrams and figures if appropriate.

Problem 1. Two people arrive separately at a restaurant between 5:00 p.m. and 6:00 p.m. Each arrives at a random time during the hour (so all possible arrival times are equally likely for both people). What is the probability that they arrive within 10 minutes of one another?

Problem 2. What is the height of a regular pentagon whose edge length is 1? Note: please COMPUTE this height − no credit will be given for an answer without mathematical justification.

Problem 3. A *subsquare* is an integral square formed from the 1-by-1 unit squares on a checkerboard. How many subsquares exist on an n−by−n checkerboard?