

## Project 1

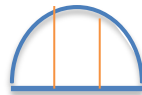
This project is due at the beginning of class on Wednesday, Week 3. It may be turned in in person or uploaded into Moodle. It should be written in full sentences and typed, although please note that equations and math symbols may be written in by hand. While it is acceptable, and encouraged, to work together in thinking about this project, each student is expected to write up results independently.

### Problem 1

In class, you copied your handprint, and then estimated the area of your hand. What is that estimate? While you don't know the actual area of your hand, and are not likely to find a function which exactly models it, is your estimate within  $1/10$  of the actual area? That is, is the difference between your measurement and the actual area no more than  $1/10$  of the actual area? How can you tell? If it is not, make your estimate better so that it is within  $1/10$  of the actual area. If it is, make your estimate so that it is within  $1/100$  of the actual area.

### Problem 2

My friend is building a house, and it's beautiful so far, with the framing for a living room with tall cathedral ceilings! He's going to put a big window in that room – a semi-circle shape with a diameter of 5 ft. Here's where he has asked me, and now you, to help. He wants to divide the glass pane of the semicircle into 3 smaller panes, but with vertical cuts, as shown below. How far from the ends should the cuts be made so that all three panes have equal area? *(By the way, your textbook will be a helpful resource for a formula or two involving the arcsine. You might want to remind yourself about that function once you've reduced the problem to computation.)*



### Problem 3

Are these problems related in any fundamental way beyond that they both use the word "area"? Discuss.