

Figure 1:

**Mathematics 122A,B**

**Fall 2004**

**Project 5**

**Not to be turned in**

---

**Study Group Members**

---

**Name**

**Only write on one side of each page.**

I encourage you to work with others on this quiz. As with all writing you should work out the details in a draft before writing a final solution. Be sure to follow the writing guidelines listed in the course information sheet unless explicitly directed to do otherwise in the problem statement. You do not need to include every algebra or arithmetic step but you should include enough detail to allow a member of your target audience to reconstruct any missing steps. Be sure to include in-line citations, with page numbers if appropriate, every time you use the results of discussion, a text, notes, or technology. If you include graphs, they should be done carefully on graph paper. Finally, there is to be no collaboration in the writing of your solution even if you worked out the details with other people.

*“Anyone can do any amount of work provided it isn’t the work he is supposed to be doing at the moment.”*  
— Robert Benchley

### **Problems**

1. Find the volume common to two right circular cylinders of radius  $R$  that meet at a right angle. A physical model is available for perusal at my office. The figure below shows one-eighth of the region (note the axes of the cylinders are perpendicular). [Hint: Use horizontal cross-sections.]