Homework 12 - Math 141, Frank Thorne (thornef@mailbox.sc.edu)

Due Friday, December 4

Important For all area and volume problems, please sketch the region or solid whose area or volume you are computing, and draw and label a typical slice.

(a) What is the formula for the area between two curves? Why is it true? Explain and give an illustrative example.

(b) Thomas, Ch. 5.6, 1-8, 51-68, 73-76, 81-86 (even required, odd additional).

(c) Find the volume of a right cylindrical cone with radius r and height h.

(d) Find the volume of a pyramid, whose bottom is a square with side length b, and which has height h.

(e) Find the volume of a sphere with radius r.

(f) Find the volume of a hollowed out sphere of radius r, with a smaller sphere of radius s removed from the center. (Hint: there is an easy way!)

(g) You remove the cap of a sphere of radius r. Assume that the cap has height $h < r$ and that its base is a circle. Find the volume of the cap and the volume of the remaining portion of the sphere.

(h) Thomas, Ch. 6.1, 1-4, 10-13, 19-24, 39-44 (even required, odd additional).