

Written Homework #1**Due at start of class Wednesday 24 January.**

This Written Homework covers sections 6.1 and 6.2. You may work on it with other students; that is encouraged! It is also a “work sheet” to do during the Tuesday recitation section. The submitted version will, of course, be written by you. You must show your work for full credit.

1. Sketch the region enclosed by the given curves, and find the enclosed area by integration with respect to your preferred variable:

$$4x + y^2 = 12, \quad x = y$$

2. Sketch the region enclosed by the given curves, and find the enclosed area by integration:

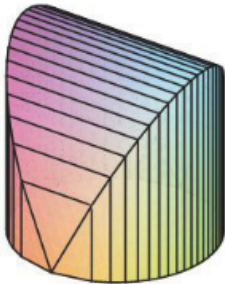
$$y = x^4, \quad y = 2 - |x|$$

(*Hint.* The points of intersection are at convenient locations.)

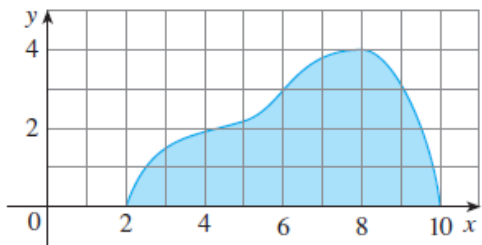
3. Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified line. Sketch the region, the solid, and a typical disc or washer:

$$xy = 1, \quad y = 0, \quad x = 1, \quad x = 2, \quad \text{about } x = -1$$

4. Find the volume of the solid S (as shown) whose base is a circular disk with radius r , and in which parallel cross-sections perpendicular to the base are squares.



5. (a) If the region shown in the figure is rotated about the x -axis to form a solid, use the midpoint rule with $n = 4$ to estimate the volume of the solid.



(b) Estimate the volume if the same region is rotated about the y -axis. Again use the midpoint rule with $n = 4$.