

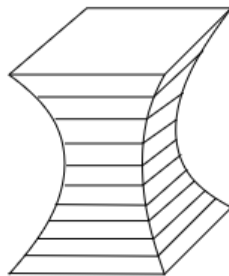
MAT126 Homework 4

Problem 1. Find the area of the bounded region lying between the curves $y = x^2$ and $y = 4x - x^2$.

Problem 2. Find the area of the region enclosed by the line $y = x + 1$ and the parabola $y^2 = 6x + 22$.

Problem 3. A pillar that is π feet tall is made so that every horizontal cross-section at height h is a square of side length

$$s(h) = 3 - \sin(h).$$



- (a) Write an integral which represents the volume of the pillar.
- (b) Evaluate the integral to find the volume of the pillar.

Problem 4. Consider the region bounded by the below curves, with $x > 0$.

$$y = 4 - x^2, \quad y = 4x - 1, \quad x = 0.$$

What is the volume of the solid obtained by rotating this region about the line $y = -1$?

Problem 5. Let R be the region between $y = x^2$ and $y = 2x$.

(a) Find the points of intersection of these two curves. (Okay, one of them is a line; lines are just straight curves!!)

(b) Sketch the region R . Pick appropriate scales for x and y .

(c) Use cylindrical shells to find the volume of the solid generated when the region R is revolved about the x -axis.