

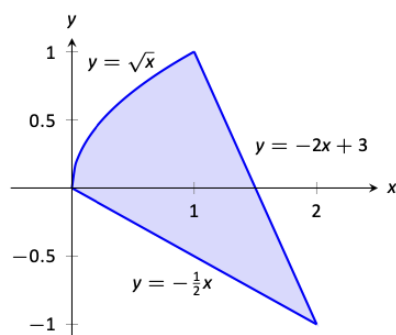
Math 102, Fall 2022 — Homework 7

Tim Chumley

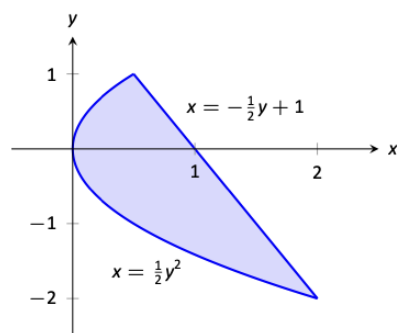
Due November 4 at 5:00 pm

Instructions. This problem set has material from Week 8 and Week 9 of class.

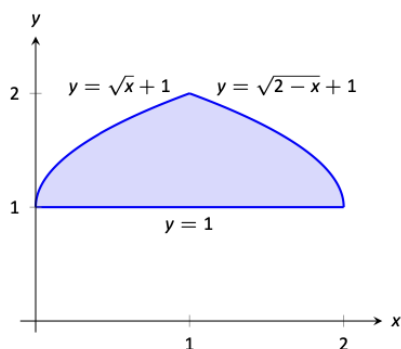
Problem 1. For each region below, set up integrals for finding the area of the region in two ways: (1) with respect to x and (2) with respect to y . No need to compute the integrals but you can use software like Wolfram Alpha to compute both and check that you get the same answer.



a.



b.



c.

d. A triangle with vertices $(-1, 1)$, $(1, 3)$, and $(2, -1)$.

Problem 2. For each of the regions bounded by the curves below, use the Disk Method or Washer Method to set up an integral for finding the volume of the solid that is formed by revolving the region around the x -axis. You do not need to compute the integral.

a. $y = -x^2 + 6x, y = 0$

b. $y = \sqrt{x}, y = x$

c. $y = (x + 1)^2, y = 1$

d. $y = e^{3x}, y = e^x, x = 1$

Problem 3. Consider the bounded region between $y = x^2$ and $y = 5x$. Use the Disk Method or Washer Method to set up an integral for finding the volume of the solid that is formed by revolving the region around each of the following axes. You do not need to compute the integral.

a. $y = 0$

b. $x = 0$

c. $y = -4$

d. $x = -3$

Problem 4. Consider the region bounded by $y = 4 - x^2$ and $y = 0$. Use the Shell Method to set up an integral for finding the volume of the solid that is formed by revolving the region around each of the following axes. You do not need to compute the integral.

a. $x = 2$

b. $x = -2$

c. $y = 0$

d. $y = 4$