HW 6: Section 5.1 and 5.2

Due: Monday, September 23rd in SQRC by 9pm

Learning Goals:

- Compute the area bounded by a given set of equations. This includes breaking up an area into multiple pieces and integrating with respect to either y or x when appropriate.
- Sketching solids such as pyramids and solids of revolution.
- Find the volume of a solid by breaking it into pieces and using an integral.

Questions:

1. Problem 5.1.38. Consider the region bounded by $x^2 - x$ and $y = 0$. Find the value of k that that the line $y = kx$ splits this region into two equal area pieces.

2. Problem 5.2.6. Find the volume of a pyramid of height 160ft that has a square base of side 300ft.

3. Compute the volume of the solid of revolution formed by rotating the region bounded by $y = (4 - x)^{1/2}, y = 0$ and $x = 0$ around the y-axis.

4. Problem 5.2.18.a. Compute the volume of the solid of revolution formed by rotating the region bounded by $y = x^2, y = 4 - x^2$ about the x-axis.

5. Compute the volume of the solid of revolution formed by rotating the region bounded by $y = x^2, y = 4 - x^2$ about the line $y = 6$.

6. Compute the volume of the solid of revolution formed by rotating the region bounded by $y = x^2, y = 4 - x^2$ about the line $x = 2$.