

Homework Set 1

DUE: JAN 24 - 26, 2017 (AT THE BEGINNING OF RECITATION)

1. The base of a solid is the region between the x -axis, $y = 2\sqrt{x}$, and $x = 5$. Each cross section perpendicular to the x -axis is a semicircle with diameter running along the base. What is the volume of this solid?
2. Find the volume of the solid obtained by revolving the region bounded by $y = e^x$, $x = 0$, $y = 0$, and $x = \ln 2$ about the x -axis.
3. Find the volume of the solid obtained by revolving the region bounded by $x = \frac{1}{2}y^2$ and $y = x - 4$ about the y -axis.
4. Find the volume of the solid obtained by revolving the region bounded by $y = \sqrt{x}$, $x = 1$, $y = \frac{1}{2}$, and $x = 3$ about the y -axis.
5. Find the volume of the solid obtained by revolving the region bounded by the line $y = x$ and the parabola $y = x^2$ about the line $x = 2$.
6. (Thomas §6.2 Exercise 43, p. 383) Derive the formula for the volume of a right circular cone of height h and radius r using an appropriate solid of revolution.