Section 6.2: Volumes

Problem 1.

(a) Show, using an integral, that the volume of a circular cylinder with height h and base radius r is $V = \pi r^2 h$.

(b) Find, using an integral, the volume of a right circular cone with height h and base radius r.

Problem 2. Find the volume of the solid obtained by rotating the region bounded by the given curves about the specified line.
Sketch the region, the 3-dimensional solid formed by rotating the region $360°$ about the line, and a typical disk or washer.

(a) $y = e^x$, $y = 0$, $x = -1$, and $x = 1$; about the x-axis,

(b) $2x = y^2$, $x = 0, y = 4$; about the y-axis,

(c) $y = x^3$, $y = 1, x = 2$; about $y = -3$.

Problem 3. Find the volume of the following solid S: The base of S is a circular disk with radius r. Parallel cross-sections perpedicular to the base are squares.