Problem 1 *Find the volume of the solid obtained by rotating the region bounded by the given curves around the specified line. Sketch the region, the solid, and a typical washer or disk.*

(a) $y = 1 - x^2, y = 0$; *around the x-axis.*

(b) $y^2 = x, x = 2y$; *around the y-axis.*

(c) $y = e^{-x}, y = 1, x = 2$; *around* $y = 2$.

Problem 2 *Each integral represents the volume of a solid. Describe and draw the solid.*

(a) $\pi \int_{-1}^{1} (1 - y^2)^2 dy$

(b) $\pi \int_0^{\pi/2} [(1 + \cos x)^2 - 1^2] dx$

Problem 3 *You put a 1"-radius ball of ice cream in an ice cream cone, so only the top 1.5" are visible. How much ice cream can you eat before biting the cone? (That is, what is the volume of ice cream above the cone?)*

Problem 4 *Compute the volume of a solid S. The base of S is the region enclosed by the parabola $y = 1 - x^2$ and the x-axis. The cross-sections of S perpendicular to the y-axis are squares.*