

**MATH 155A FALL 13
EXAMPLES SECTION 5.3.**

Question. Use the method of cylindrical shells to find the volume generated by rotating the region bounded by $y = x^2$ and $y = 2 - x^2$ about $x = 1$.

Solution. The shell has radius $1 - x$, circumference $2\pi(1 - x)$, and height $(2 - x^2) - x^2 = 2 - 2x^2$. The curves intersect at $x = \pm 1$. Thus

$$\begin{aligned} V &= \int_{-1}^1 2\pi(1 - x)(2 - 2x^2) dx \\ &= 4\pi \int_{-1}^1 (1 - x - x^2 + x^3) dx \\ &= \frac{16}{3}\pi. \end{aligned}$$

URL: <http://www.disconzi.net/Teaching/MAT155A-Fall-13/MAT155A-Fall-13.html>