

Calculus(II) Quiz5(04/16)

1.

3-7 Use the method of cylindrical shells to find the volume generated by rotating the region bounded by the given curves about the y-axis.

$$y = x^2, \quad 0 \leq x \leq 2, \quad y = 4, \quad x = 0$$

[Solution]

$$\begin{aligned} V &= \int_0^2 2\pi x(4 - x^2) dx = 2\pi \int_0^2 (4x - x^3) dx \\ &= 2\pi \left[2x^2 - \frac{1}{4}x^4 \right]_0^2 = 2\pi(8 - 4) \\ &= 8\pi \end{aligned}$$

