

Solutions

Each answer shows the steps, then the **result**.

2.1

- $V = \pi \int_a^b (R_{\text{outer}}^2 - R_{\text{inner}}^2) dx$

2.2

- $\pi(16 - 4) = 12\pi$

2.3

- $\pi \left[\frac{x^2}{2} - \frac{x^3}{3} \right]_0^1 = \pi \left(\frac{1}{2} - \frac{1}{3} \right) = \frac{\pi}{6}$

3.1 B

- subtract the **squares** of the radii

3.2

(a)

- On $(0, 1)$, $y = x$ is above $y = x^2$; outer $R = x$, inner $r = x^2$

(b)

- $V = \pi \int_0^1 (x^2 - x^4) dx = \pi \left[\frac{x^3}{3} - \frac{x^5}{5} \right]_0^1 = \pi \left(\frac{1}{3} - \frac{1}{5} \right) = \frac{2\pi}{15}$

3.3

- Outer $R = 4$, inner $r = x^2$; $V = \pi \int_0^2 (4^2 - (x^2)^2) dx = \pi \int_0^2 (16 - x^4) dx$