

AP CALCULUS AB

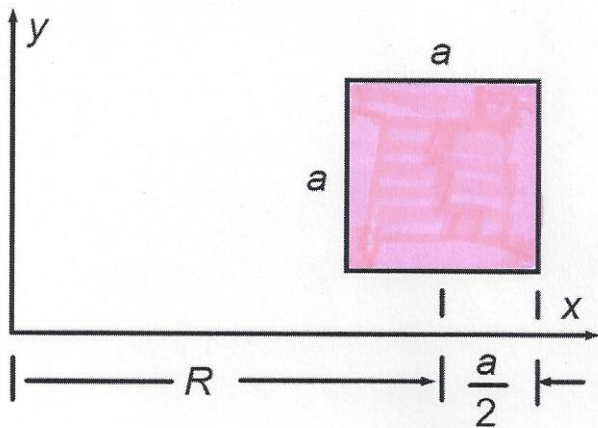
- 1) Verify the integral

$$\int x \sin\left(\frac{\pi x}{4}\right) dx =$$

$$= -\frac{4}{\pi} x \cos\left(\frac{\pi x}{4}\right) + \frac{16}{\pi^2} \sin\left(\frac{\pi x}{4}\right)$$

by differentiation.

- 2) Calculate the volume of the solid generated by rotating the shaded square region around the y -axis.



CYLINDRICAL SHELLS

- 3) Calculate the volume of the solid generated by rotating the shaded area under

$$y = 2 \sin\left(\frac{\pi x}{4}\right) \text{ on } x \in [8, 12]$$

around the y -axis. You will need to use the integral from problem 1.

