

AP CALCULUS AB

- 1) Verify the integral

$$\int \sin^2\left(\frac{\pi x}{8}\right) dx = \frac{1}{2} \left[x - \frac{8}{\pi} \sin\left(\frac{\pi x}{8}\right) \cos\left(\frac{\pi x}{8}\right) \right]$$

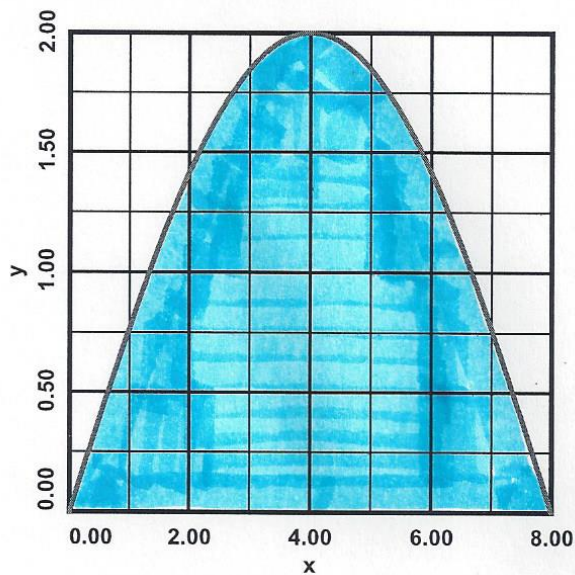
by differentiation. *Hint:* use

$$\sin^2\left(\frac{\pi x}{8}\right) + \cos^2\left(\frac{\pi x}{8}\right) = 1.$$

- 2) Find the volume of the solid generated by revolving the shaded area under

$$y = 2 \sin\left(\frac{\pi x}{8}\right)$$

around the x – axis. You will need to use the integral from problem 1.



SOLIDS OF REVOLUTION

- 3) Find the volume of the solid generated by revolving the shaded area around the x – axis.

