

PRINT Your Name: _____

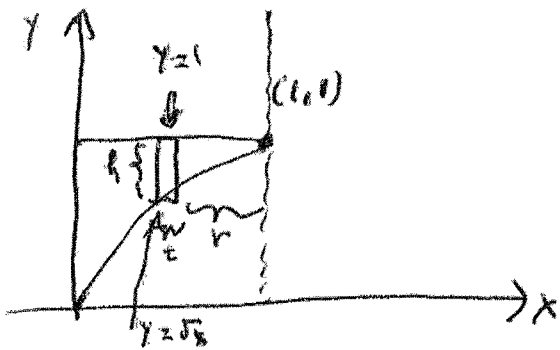
Quiz 7 — October 14, 2013 — Section 2 — 4:40 — 5:30

Remove everything from your desk except a pencil or pen.

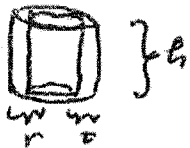
Circle your answer. Show your work. Your work should be correct and coherent. Draw a meaningful picture.

The quiz is worth 5 points.

Consider the region bounded by the y -axis, $y = \sqrt{x}$, and $y = 1$.
Revolve the region about the line $x = 1$. Find the volume of the resulting solid.
You must draw a meaningful picture.



Chop the x -axis from $x=0$ to $x=1$,
 Over each piece of the x -axis
 draw a rectangle. Rotate the
 rectangle with x -coordinate x .
 Get a shell



of volume $2\pi r h t$

where $t = 1 - x$

$$h = 1 - \sqrt{x}$$

$$t = dx$$

The volume of one shell is $2\pi(1-x)(1-\sqrt{x})dx$

The volume of the solid is $2\pi \int_0^1 (1-x-x^2+x^{\frac{3}{2}}) dx$

$$= 2\pi \left(x - \frac{x^2}{2} - \frac{2x^{\frac{3}{2}}}{3} + \frac{2}{5}x^{\frac{5}{2}} \right) \Big|_0^1$$

$$= 2\pi \left(1 - \frac{1}{2} - \frac{2}{3} + \frac{2}{5} \right)$$

$$= 2\pi \left(\frac{30 - 15 - 20 + 12}{30} \right)$$

$$= \frac{14\pi}{30} = \boxed{\frac{7\pi}{15}}$$