

31 May 2006

Quiz 1 - Math 152

Let A be the area bounded by

$$y = \sqrt{\sin x}$$

$$y = 0$$

$$x = 0$$

$$x = \pi$$

What is the volume of the solid obtained by rotating A around the x -axis?

Solution. We slice vertically. At some x -value, $0 \leq x \leq \pi$, a cross-section is a circle with radius $\sqrt{\sin x}$ and therefore area $\pi \sin x$. Therefore, the volume V is equal to

$$V = \int_0^{\pi} \pi \sin x \, dx = \pi(-\cos x)|_0^{\pi} = \pi(1 + 1) = 2\pi$$

So our volume is equal to 2π .