PRINT Your Name:_____

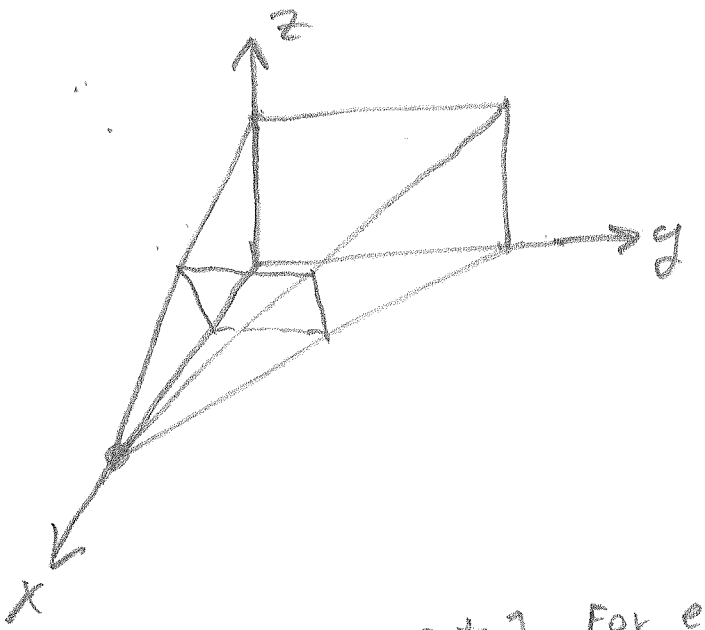
Quiz 7 — February 28, 2014 – Section 7 – 12:00 – 12:50

Remove everything from your desk except this page and a pencil or pen.
The solution will be posted soon after the quiz is given.

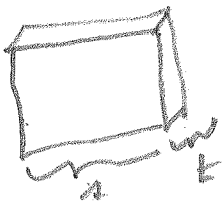
Circle your answer. **Show your work. Your work must be correct and coherent.**
The quiz is worth 5 points.

Consider the solid S. The base of S is the triangular region in the xy-plane with vertices $(0,0)$, $(1,0)$, and $(0,1)$. The cross sections of S which are perpendicular to the x-axis are squares. Find the volume of S. You must draw a meaningful picture.

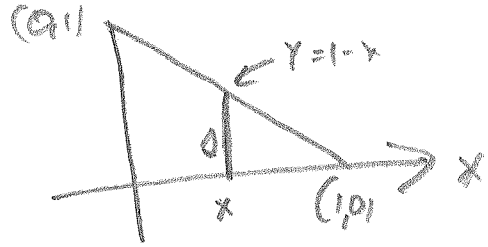
Section 17



Chop the x-axis from 0 to 1. For each x-coordinate, consider the slice of the solid with x-coordinate x. This slice looks like a square with thickness



The volume of this slice is $s^2 t$ where $t = dx$ and s comes from looking at the picture



$s = 1-x$

The vol of the slice is $s^2 t = (1-x)^2\,dx$. The volume of the solid is $\int_0^1 (1-x)^2\,dx = \frac{-(1-x)^3}{3}\Big]_0^1 = \boxed{\frac{1}{3}}$

Check the solid is a pyramid with base of area 1. Because the solid has volume $\frac{1}{3}$ area of base $h = \frac{1}{3}(1)(1) = \frac{1}{3}$