

## Quiz 13

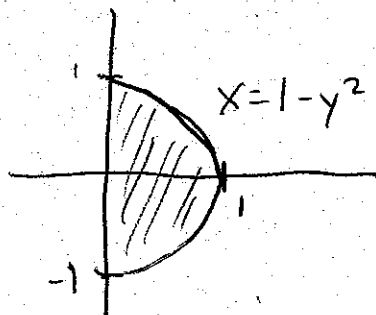
Math 1A, section 103

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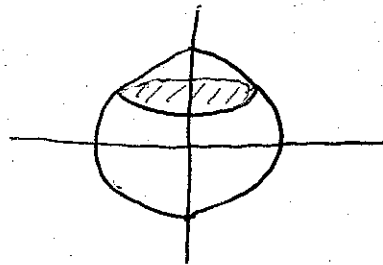
1. Describe a solid whose volume is represented by the following integral.

$$\pi \int_{-1}^1 (1-y^2)^2 dy$$

We can describe this integral as a volume of revolution of the area under the curve  $x=1-y^2$  from the  $y$ -intercept at  $-1$  to the  $y$ -intercept at  $1$ . The bounded region looks like:



Revolving this about the  $y$ -axis, we get an oblong shape whose cross-sectional area at height  $y$  is  $\pi(1-y^2)^2$ . Its volume is then the integral



$$\pi \int_{-1}^1 (1-y^2)^2 dy.$$