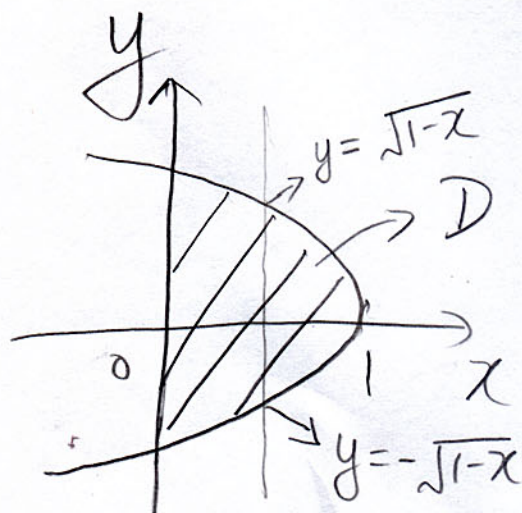
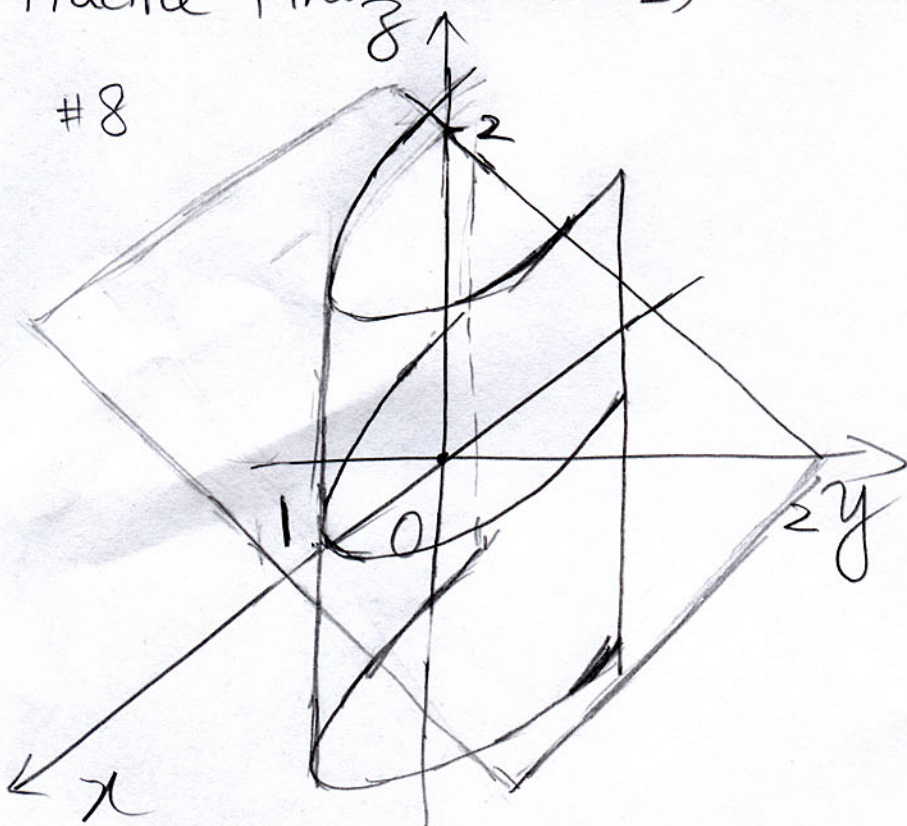


Practice Final 2 (21C-E)

#8



From the graph above, the solid is under the plane  $z+y=2$  & above the  $xy$ -plane (since we want the region bounded by  $z=0$ )  
Therefore, we want to integrate

$$z = f(x, y) = z = 2 - y \quad , \text{ i. e.}$$

$V = \iint_D (2-y) dA$  . And since the boundary is  $x=0$  and  $x=1-y^2$  on the  $xy$ -plane,

$$D = \{(x, y) \mid 0 \leq x \leq 1 - y^2\}$$

$$\begin{aligned} \Rightarrow V &= \int_0^1 \int_{-\sqrt{1-x}}^{\sqrt{1-x}} (2-y) dy dx = \int_0^1 \left( 2y - y^2 \cdot \frac{1}{2} \right) \Big|_{-\sqrt{1-x}}^{\sqrt{1-x}} dx \\ &= \int_0^1 4\sqrt{1-x} dx = -\frac{8}{3} (1-x)^{\frac{3}{2}} \Big|_0^1 = \frac{8}{3} \end{aligned}$$