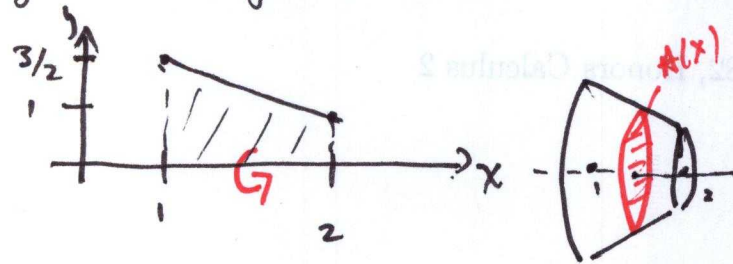


6.2 : 1, 6, 19, 20, 51

1.  $y = 2 - \frac{1}{2}x$ ,  $y = 0$ ,  $x = 1$ ,  $x = 2$



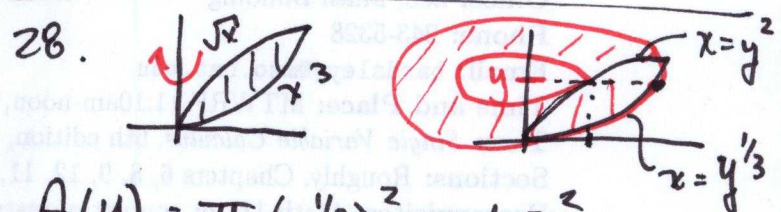
$A(x) = \pi (2 - \frac{1}{2}x)^2 = \pi (4 - 2x + \frac{1}{4}x^2)$

$V = \int_1^2 A(x) dx = \int_1^2 (\pi \cdot 4 - 2\pi x + \frac{\pi}{4} x^2) dx$

$= 4\pi x \Big|_1^2 - \pi x^2 \Big|_1^2 + \frac{\pi}{12} x^3 \Big|_1^2$   
 $= 8\pi - 4\pi - 4\pi + \pi + \frac{8}{12}\pi - \frac{\pi}{12}$   
 $= 19\pi/12$

$A(x) = \pi (1)^2 - \pi (\sqrt{x})^2$   
 $= \pi (1-x)$

$V = \int_0^1 \pi (1-x) dx = \pi (x - \frac{x^2}{2}) \Big|_0^1 = \frac{\pi}{2}$

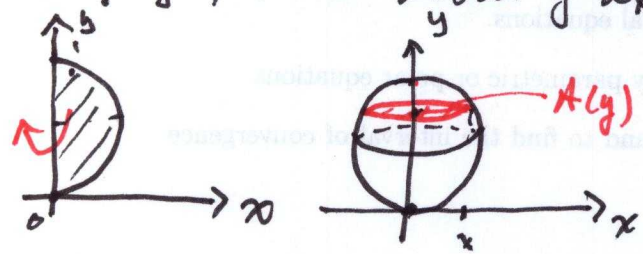


$A(y) = \pi (y^{1/3})^2 - \pi (y^2)^2$   
 $= \pi (y^{2/3} - y^4)$

$V = \int_0^1 \pi (y^{2/3} - y^4) dy$   
 $= \pi (\frac{3}{5} y^{5/3} - \frac{y^5}{5}) \Big|_0^1$

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

6.  $x = y - y^2$ ,  $x = 0$  about y-axis

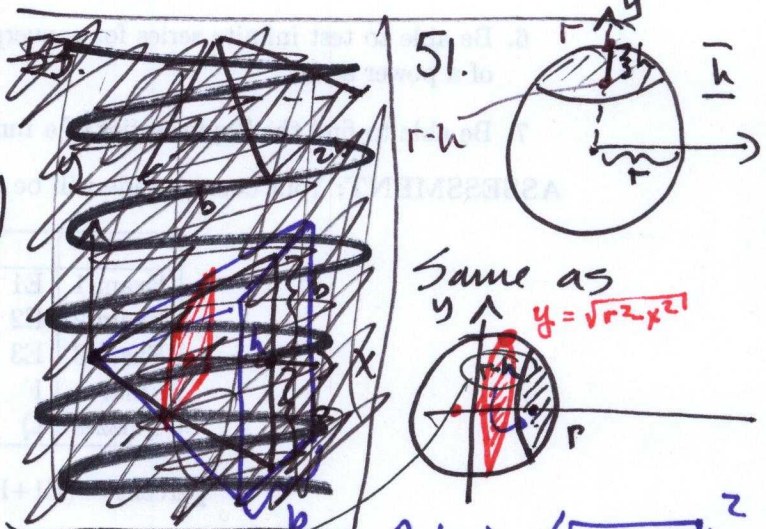


Area =  $A(y) = \pi (y - y^2)^2 = \pi (y^2 - 2y^3 + y^4)$

$V = \int_0^1 \pi (y^2 - 2y^3 + y^4) dy$

$= \pi (\frac{y^3}{3} - \frac{1}{2} y^4 + \frac{y^5}{5}) \Big|_0^1$   
 $= \pi (\frac{1}{3} - \frac{1}{2} + \frac{1}{5})$

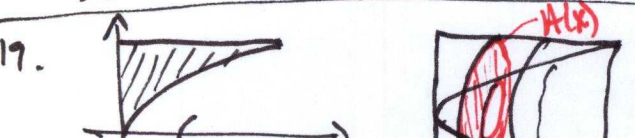
$= \frac{1}{30}\pi$



51. Same as  $y = \sqrt{r^2 - x^2}$

$A(x) = (\sqrt{r^2 - x^2})^2 \cdot \pi$

$V = \int_{-r}^r \pi (r^2 - x^2) dx = \pi (r^2 x - \frac{x^3}{3}) \Big|_{-r}^r$   
 $= \pi (r^2 r - \frac{r^3}{3}) - \pi (-r^2 r + \frac{r^3}{3}) = \frac{4}{3}\pi r^3$



19.