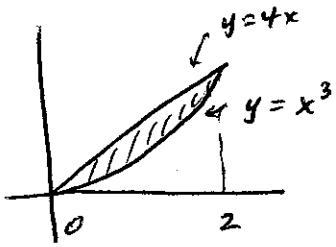
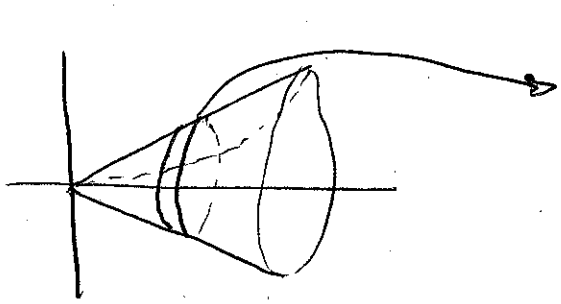
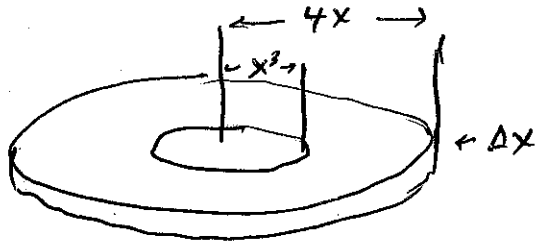
Group Work 1



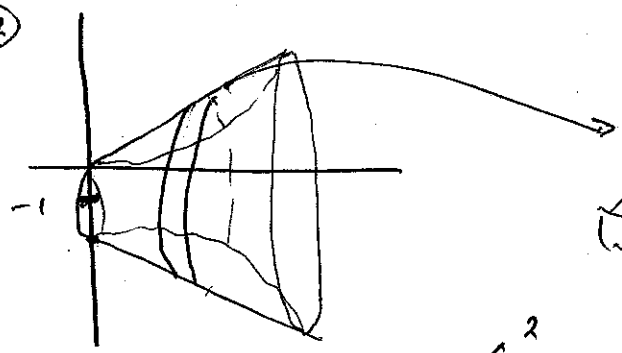
① Rotate about x-axis

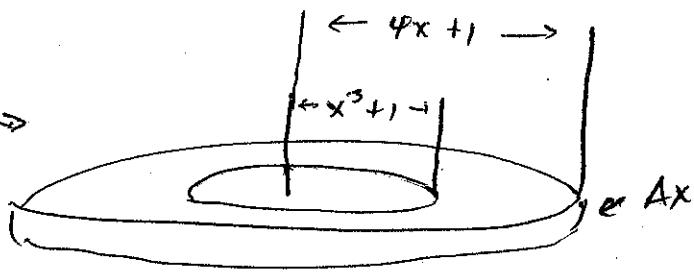




$$A = \int_0^2 \pi \left((4x)^2 - (x^3)^2 \right) dx$$

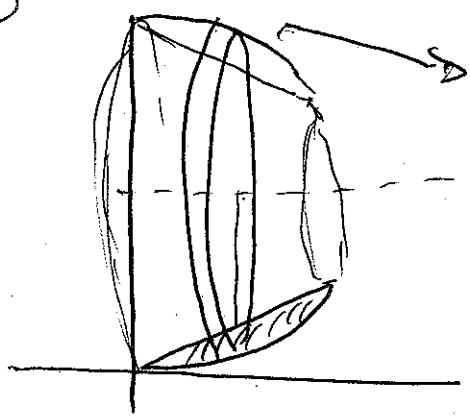
②

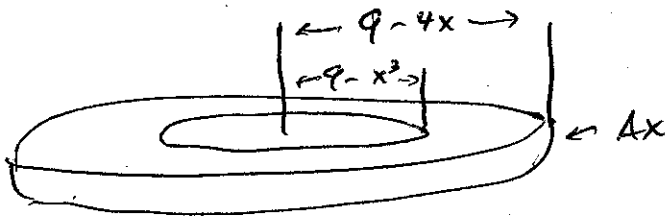




$$A = \int_0^2 \pi \left((4x+1)^2 - (x^3+1)^2 \right) dx$$

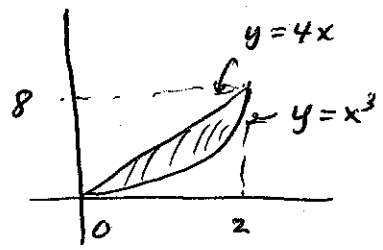
③



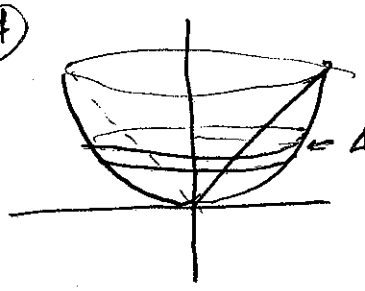


$$A = \int_0^2 \pi \left((9-4x)^2 - (9-x^3)^2 \right) dx$$

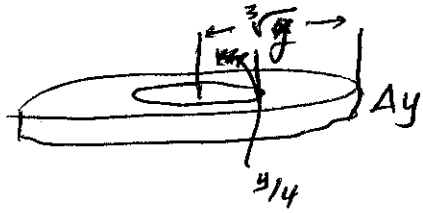
Group Work 1, Continued



④

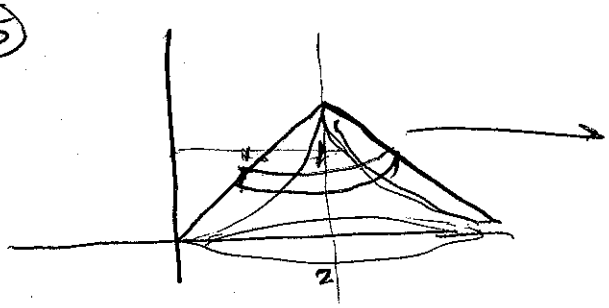


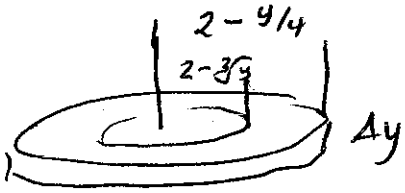
← Δy, so write the functions in y →



$$A = \pi \int_0^8 \left((\sqrt[3]{y})^2 - (y/4)^2 \right) dy$$

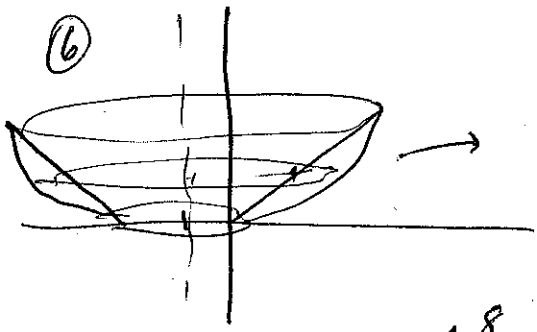
⑤

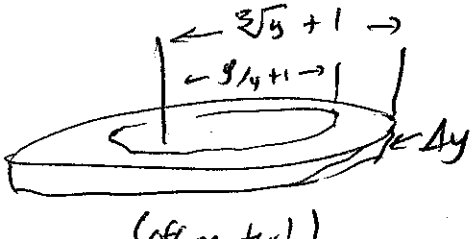




$$A = \int_0^8 \pi \left((2 - y/4)^2 - (2 - \sqrt[3]{y})^2 \right) dy$$

⑥



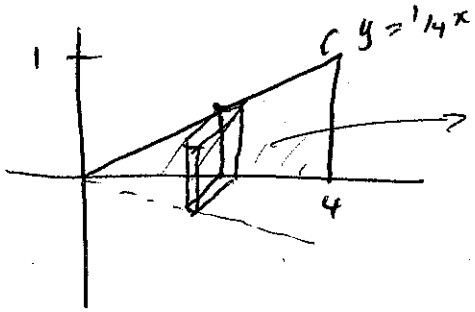


(off center!)

$$A = \int_0^8 \pi \left((\sqrt[3]{y} + 1)^2 - (y/4 + 1)^2 \right) dy$$

Group Work 3 solns

① Base is in the xy plane

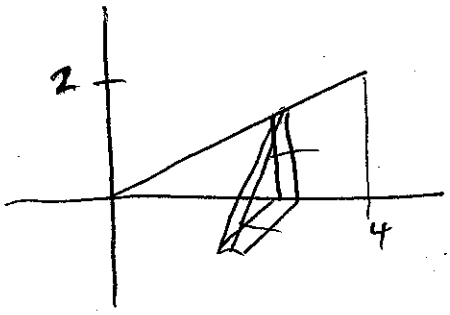


Area of a slice: $(\frac{1}{4}x)^2 \Delta x$

$$A = \int_0^4 (\tfrac{1}{4}x)^2 dx$$

$$= \int_0^4 \tfrac{1}{16}x^2 dx = \tfrac{4}{3}$$

② Base is in the xy plane

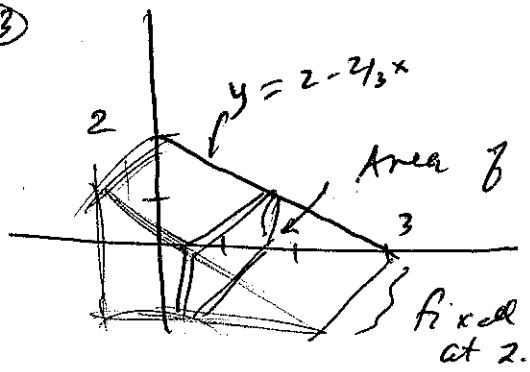


Area of a slice: $\frac{1}{2} b h \cdot \Delta x$

Since isosceles, $\frac{1}{2} b^2 \Delta x = \frac{1}{2}(\frac{1}{2}x)^2 \Delta x$

$$A = \int_0^4 \tfrac{1}{2}(\tfrac{1}{2}x)^2 dx = 8/3$$

③

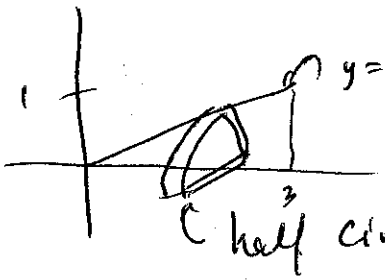


Area of slice is $bh\,\Delta x$

or $(2.5)(2 - \frac{2}{3}x)\,\Delta x$

$$\int_0^3 2.5\left(2 - \tfrac{2}{3}x\right) dx = \cdots$$

④



$$A = \int_0^3 \tfrac{1}{2}\pi\left(\tfrac{1}{3}x\right)^2 dx = \pi/2$$