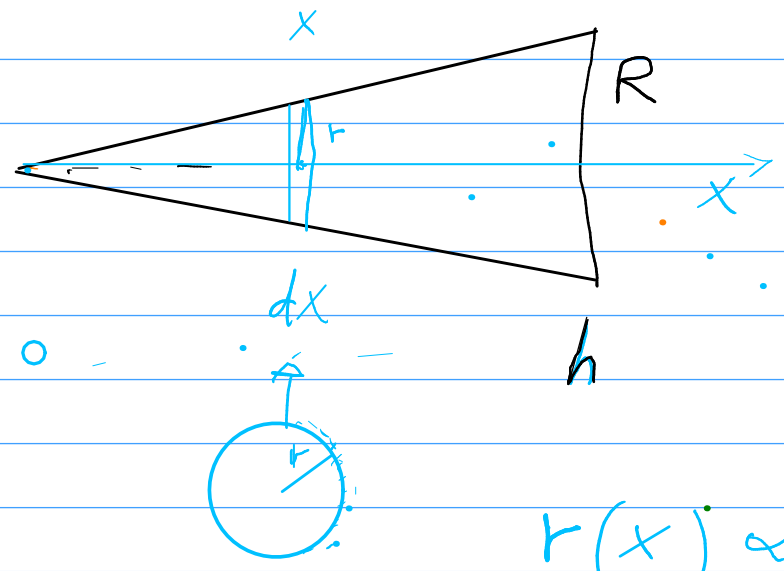
$\Delta x \longrightarrow dx$



$r(x) \propto x$

$a \propto r$

$= \frac{g}{R_T} r$

$r(x) = \frac{R}{h} x$

$A(r) = \pi r^2$

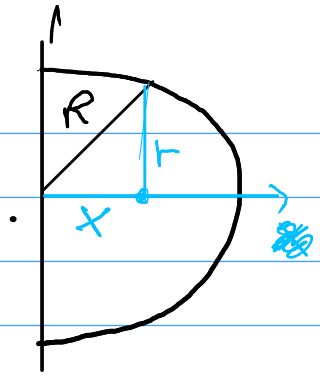
$A(x) = \pi \left(\frac{R}{h} \cdot x\right)^2$

$= \frac{\pi R^2}{h^2} x^2$

$dV = A(x)\, dx$

$$V = \int_0^h dV = \int_0^h A(x)\, dx = \int_0^h \frac{\pi R^2}{h^2} x^2 dx$$

$$= \frac{\pi R^2}{h^2} \frac{1}{3} h^3 = \frac{1}{3} A_B \cdot h$$



$\leftarrow R \rightarrow$

$$r(x) = \sqrt{R^2 - x^2}$$

$$A(r) = \pi r^2$$

$$A(x) = \pi\left(R^2 - x^2\right)$$

$$dV = A(x)\,dx$$

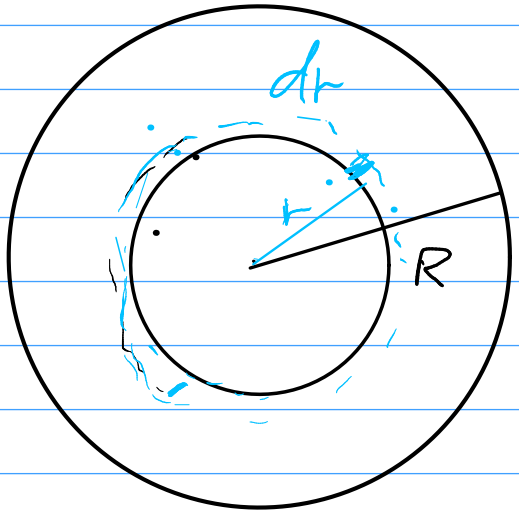
$$V_{\frac{1}{2}S} = \int_0^R A(x)\,dx = \int_0^R \pi\left(R^2 - x^2\right)dx$$

$$= \pi\int_0^R R^2\,dx - \pi\int_0^R x^2\,dx$$

$$= \pi R^3 \cdot \cancel{R} - \pi\frac{1}{3}R^3$$

$$= \pi R^3\left(1 - \frac{1}{3}\right) = \frac{2}{3}\pi R^3 \quad !$$

$$V = \frac{4}{3}\pi R^3$$



$A(r) \longrightarrow dV = A(r)\,dr$

$$A(r) = \frac{dV}{dr} = \frac{d}{dr}\underbrace{\frac{4}{3}\pi r^3}_{V(r)}$$

$$= 4\pi r^2$$

$\forall\, r \neq 0$

Se sappiamo che $A(r) = 4\pi r^2$

$\rightarrow dV = A(r)\,dr$

$$V = \int_0^R A(r)\,dr = \int_0^R 4\pi r^2\,dr = \frac{4}{3}\pi R^3$$

$\forall\, R > 0$