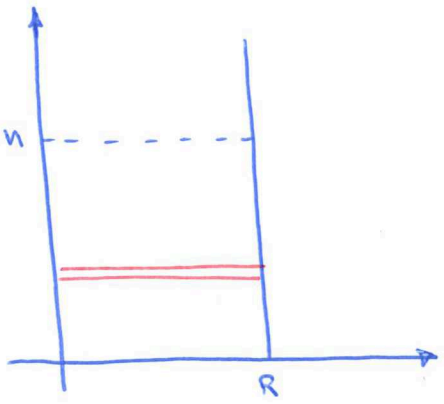
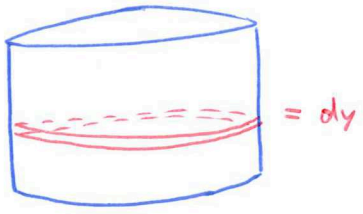
Cylinder Volume





$$dV = \pi r^2 dy$$

$$\int dV = \int_0^h \pi r^2 dy = \int_0^h \pi R^2 dy = \pi R^2 y \Big]_0^h = \pi R^2 h$$

$$\boxed{V(h) = \pi R^2 h}$$

Cylinder Change in volume

$$\forall(h) = \pi R^2 h$$

$\frac{d}{dt}$ ↓

$$\frac{d\forall}{dt} = \pi R^2 \frac{dh}{dt}$$

$$\boxed{dh = \frac{d\forall}{\pi R^2}}$$