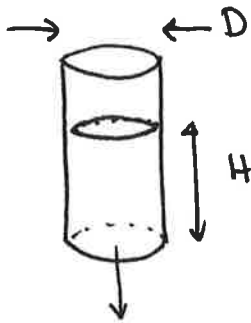


ASGV2
EX 14.1 (Fluid weight)



$$\begin{aligned} F &= mg \\ &= \rho \cdot V \cdot g \\ &= \rho \cdot A \cdot H \cdot g \\ &= \rho \pi \left(\frac{D}{2}\right)^2 H \cdot g \end{aligned}$$

If $D = 1 \text{ inch}$ & $H = 1 \text{ ft}$ then $F = 1.51 \text{ Newtons}$
 $= 0.34 \text{ lbs}$

If $D = 2 \text{ in.}$ & $H = 1 \text{ ft}$ then $F = 6.05 \text{ N}$
 $= 1.36 \text{ lbs}$

• So the force is different, but consider pressure

$$P = \frac{F}{A} = \frac{\rho A H g}{A} = \rho g H$$

• This is independent of area. So in both cases

$$\begin{aligned} P &= 2990 \text{ Pascals} \\ &= 0.433 \text{ p.s.i.} \end{aligned}$$