

FIRST EXAMPLE

$$P_1 = P_2$$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$F_2 = mg$$

$$m = 1800 \text{ kg}$$

$$F_1 = F_2 \frac{A_1}{A_2} = mg \frac{A_1}{A_2}$$

$$= (1800 \text{ kg})(9.8 \text{ N/kg}) \left(\frac{0.002}{.2} \right)$$

$$= (18 \text{ kg})(9.8 \text{ N/kg})$$

$$= 176.4 \text{ N}$$

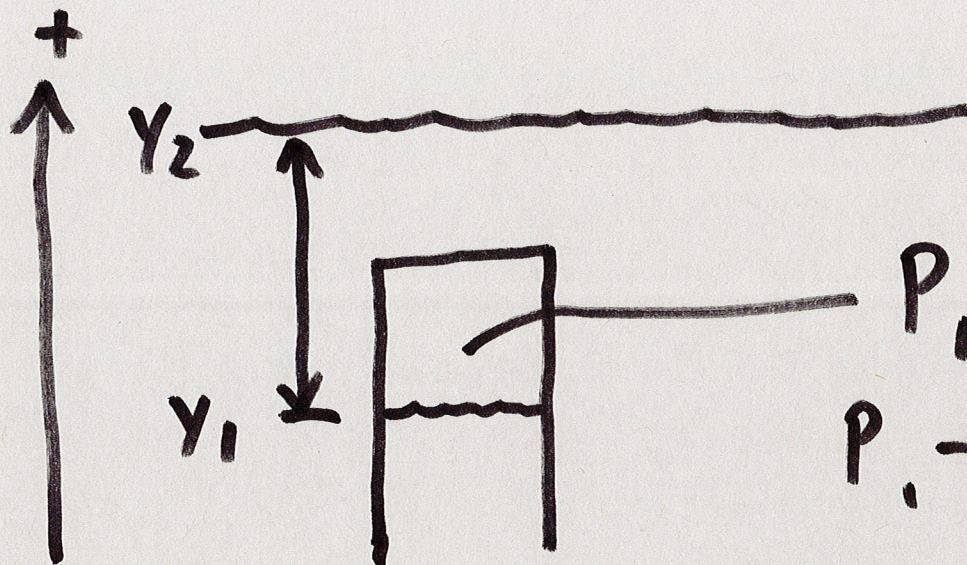
$$P_1 = P_2 + \underbrace{\rho g (\gamma_2 - \gamma_1)}_{\Delta P}$$

$$\Delta F = \Delta P A$$

$$\begin{aligned}\Delta F &= (9.8 \text{ N/kg})(1.3 \text{ kg/m}^3)(1000 \text{ m}) \frac{(0.5 \text{ cm}^2)}{(100 \text{ cm/m})^2} \\ &= 0.637 \text{ N}\end{aligned}$$

SECOND EXAMPLE

THIRD EXAMPLE



$$P_1 = P_2 + \rho g (y_2 - y_1)$$

$$P_1 - P_2 = P_2 = P_{atm}$$

$$P_1 = 2P_{atm} \quad P_2 = P_{atm}$$

$$P_1 - P_2 = P_{atm} = \rho g \Delta y$$

$$\Delta y = \frac{P_{atm}}{\rho g} = \frac{101.3 \times 10^3 \text{ N/m}^2}{(1027 \text{ kg/m}^3)(9.8 \text{ N/kg})}$$
$$= 10 \text{ m}$$

THIRD EXAMPLE (CONT.)

$$PV = \underbrace{nRT}_{\text{constant}}$$

$$P_1 V_1 = P_2 V_2$$

$$\frac{V_1}{V_2} = \frac{P_2}{P_1} = \frac{P_{\text{atm}}}{2P_{\text{atm}}} = \frac{1}{2}$$

$$\frac{V_1}{V_2} = \frac{1}{2}$$

