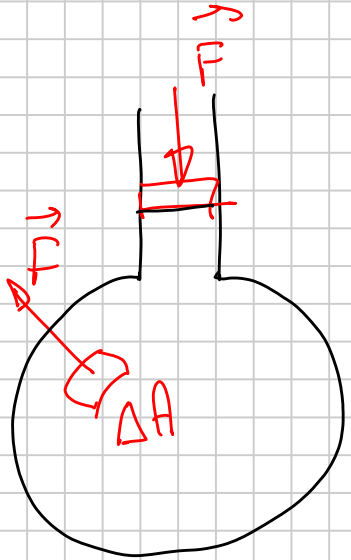
Fluids. Pressure.

Note Title 11/21/2011

$$\rho = \frac{m}{V}$$

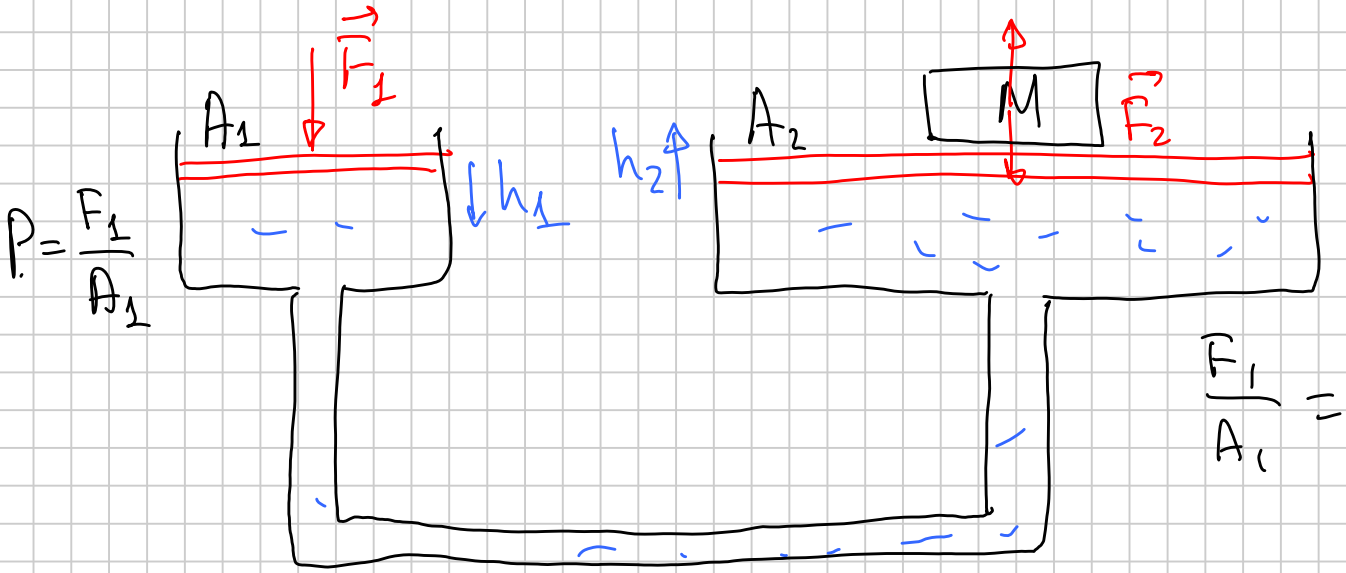


$$P = \frac{F}{A}$$

$$P = \frac{F}{\Delta A}$$

$$\frac{N}{m^2} = \text{Pascal} = \text{Pa}$$

Pressure applied to fluid is transmitted everywhere



$$P = \frac{F_1}{A_1}$$

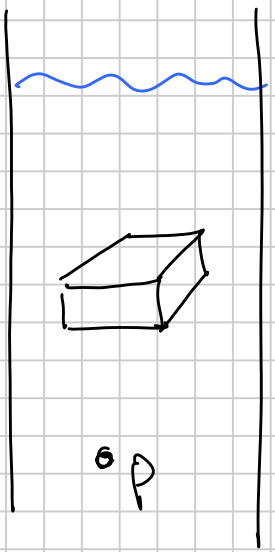
$$P = \frac{F_2}{A_2}$$

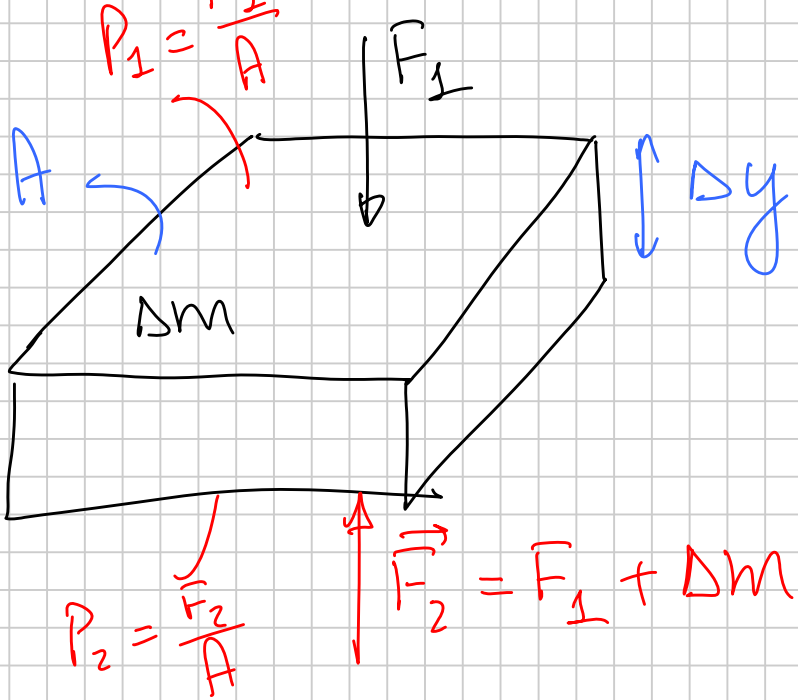
$$\frac{F_1}{A_1} = \frac{F_2}{A_2} \qquad F_2 = F_1 \frac{A_2}{A_1}$$

$$\Delta V = A_1 h_1 = A_2 h_2 \qquad h_2 = h_1 \frac{A_1}{A_2}$$

$$W = F_1 h_1 : \qquad W = F_2 h_2 = F_1 \frac{A_2}{A_1} h_1 \frac{A_1}{A_2} = \underline{F_1 h_1}$$

$$W_1 = W_2$$





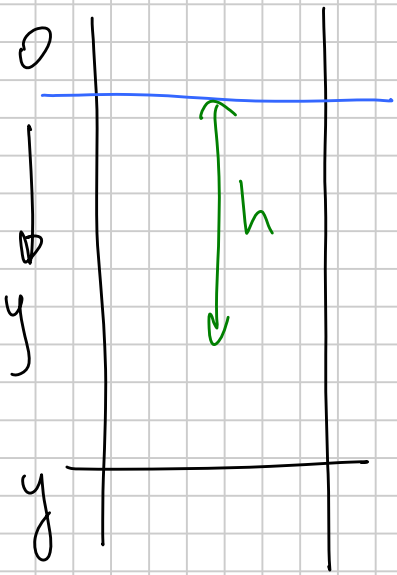
$$\Delta m = \rho \Delta V$$

$$\Delta V = A \Delta y$$

$$\vec{F_2} = F_1 + \Delta m g = F_1 + \rho A \Delta y g$$

$$\Delta F = F_2 - F_1 = \rho A \Delta y g$$

$$\Delta P = P_2 - P_1 = \frac{F_2}{A} - \frac{F_1}{A} = \frac{\Delta F}{A} = \rho g \Delta y$$



$$dP = \rho g\, dy \qquad \frac{dP}{dy} = \rho g$$

$$P = \int dP = \int_0^y \rho g\, dy = \rho g y$$

$$\boxed{P = \rho g y} \qquad \boxed{P = \rho g h}$$