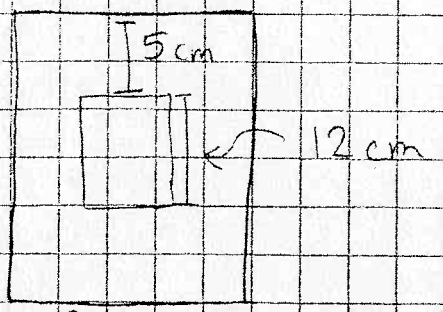
P #30

Ch 9 - Pg 297

$h_1 = .05\ m$

$h_2 = .05\ m + .12\ m = .17\ m$

(4)



$P_0 = 1.0130 \times 10^5\ N/m^2$

$A = (.10\ m)(.10\ m) = .01\ m^2$

Find P_1:

$$P_1 = P_0 + \rho \cdot g \cdot h_1$$

$$= (1.013 \times 10^5\ N/m^2) + (1000\ kg/m^3)(9.8\ m/s^2)(.05\ m)$$

$$= 101790\ Pa$$

$$P_2 = P_0 + \rho \cdot g \cdot h_2$$

$$= (1.013 \times 10^5\ N/m^2) + (1000\ kg/m^3)(9.8\ m/s^2)(.17\ m)$$

$$= 102966\ Pa$$

Find F:

$$P_1 = \frac{F_1}{A} \quad (101790\ Pa) = \frac{F_1}{.01\ m^2} \qquad \boxed{F_1 = 1018\ N}$$

$$P_2 = \frac{F_2}{A} \quad (102966\ Pa) = \frac{F_2}{.01\ m^2} \qquad \boxed{F_2 = 1030\ N}$$