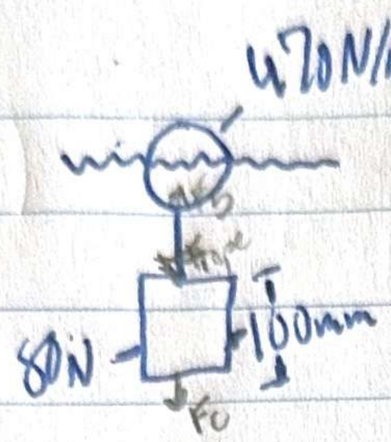
Worked with Anwar & Julia

HW 4 5.8)



V_b? $F_b = F_{rope} + F_G$ $F_b = W_c + F_G$ ☆ fluid is water

$F_b = \gamma_c V_c + F_G$

$W_b = F_b$

$W_b = \gamma_f V_d + F_G \Rightarrow V_d = \frac{W_b - F_G}{\gamma_f}$

$V_d = \frac{470 N/m^3}{}$ -

$W_F = \gamma_{FW}$

$W_F = 470 V_F$ $F_b = \rho_w g V_F = 1000 (9.81) V_F$

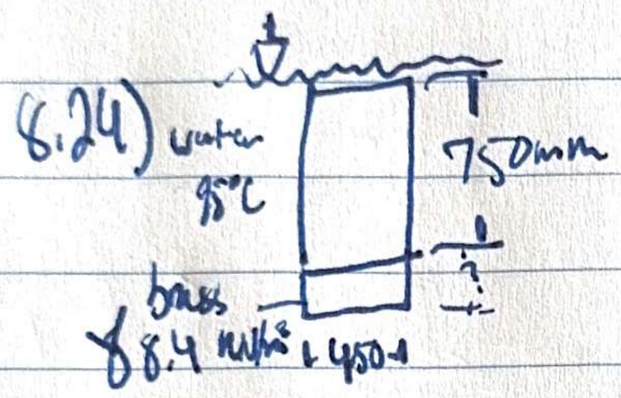
$F_b = 9810 V_F$

$F_b + F_G - W_P - W_c = 0$

$9810 V_F + 9.81 - 470 V_F - 0 = 0$

$V_F = .0025 m^3$

5.24)



WCF $_B$ $\sum F = 0$ $F_b - W_c - W_b = 0$

$V_b = \frac{\pi (.45)^2}{4}(t) = .159 t\, m^3$

$V = V_c + V_b \Rightarrow .1193 + .159t$

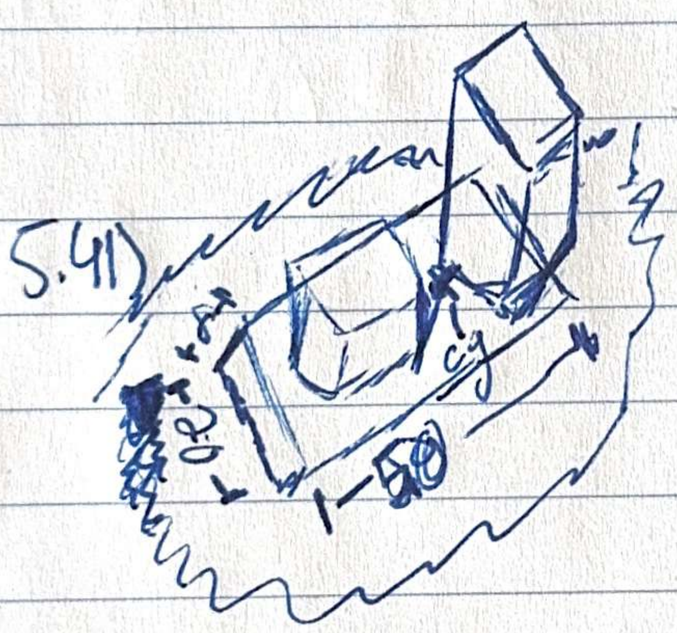
$\gamma_w V = \gamma_w V_c + \gamma_b V_b$

$9.44(.1193 + .159t) = (6.456)(.1193) + 84(.159t)$

$1.485t = .36$

$t = .03m$

5.41)



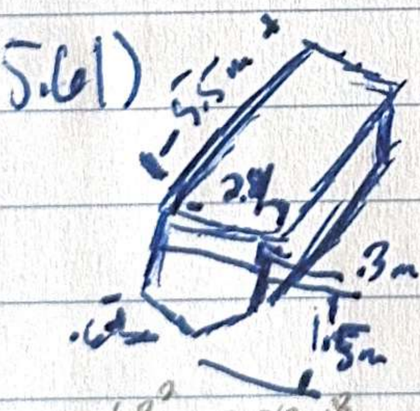
$F_b = W_{d_c} = W_p = 450000 lbs$ ☆ sea water

$V_d = W_d/\rho \Rightarrow \frac{450000}{64} = 7031.25 ft^3 = 64 lbs/ft^3$

$A_p = 50 ft (20 ft) = 1000 ft^2$

$7031.25/1000 = 7.03 ft$

5.61)



yes, Platform is 8' so there still 1' left of platform

1	3.96	.9	1.584
2	15.84	1.2	19.008
total	19.8		24.592

$y_{CG} = \frac{\Sigma(yxw)}{\Sigma w} = \frac{2.592}{19.8} = 1.04m$

$y_{CB} = \frac{\Sigma(yxw)}{\Sigma v} = \frac{15.84}{16.051} = .8875$

$M = \frac{I}{V_2} \Rightarrow V_2 = \frac{1}{2}(2.4)(.6)(5.5) + (5.5)(2.4)(.9) = 15.84 m^3$

$I = \frac{LB^3}{12} = \frac{5.50(2.4)^3}{12} = 6.34 m^4$ $MMB = \frac{6.34}{15.84} = .4m$

$y_{MG} = y_{MB} - y_{BG} \Rightarrow .8875 - .4 = 1.29 m$

stable