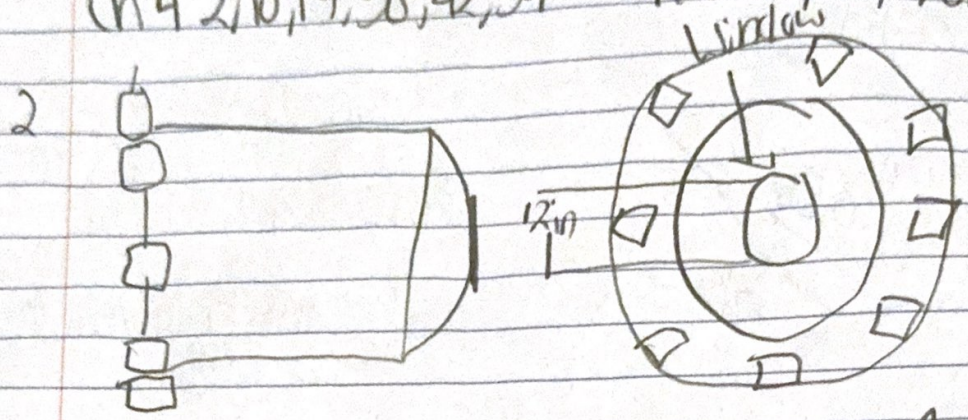
Ch 4 2, 16, 17, 38, 42, 54 Ch 5 8, 24, 4, 61



$d = 36in$

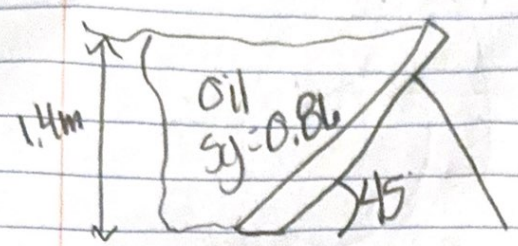
$p = 23.6 lb/in^2$

$F = pA$ $A = \frac{\pi d^2}{4} = \frac{\pi 36^2}{4}$

$F = 23.6 lb/in^2 (706.8 in^2) = 706.8 in^2$

$F = 16681.86 lb$

17) $h = 1.4m$



$F = \gamma(h/2)A$

$\sin\theta = h/L$

$L = h/\sin\theta = 1.4m/\sin(45)$

$L = 1.98m$

$A = 1.98(4) = 7.92m^2$

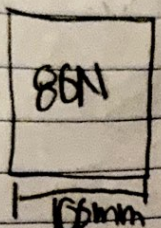
$F = \gamma(h/2)A = .82(9.81)(1.4/2)(7.92)$

$F = 46.7kN$

$\frac{L}{3} = \frac{1.98}{3} = 0.66m$

$Lp = L - L/3 = 1.98m - 0.66m = 1.32m$

8)



$L = .1m$

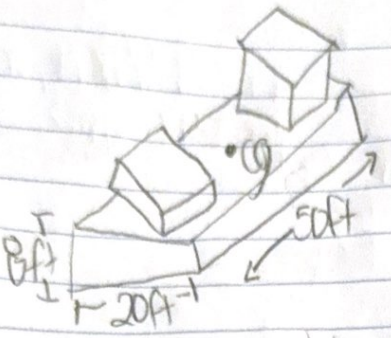
$W = 80N$

$V = s \times s \times s = .1(.1)(.1) = 10^{-3} m^3$

$W_{buoy} = \rho V_f = 470 kg/m^3 (80N)$

$V = \frac{W}{\rho(9.8)} = \frac{80}{470(9.8)} = .17m^3$

4)



W = 450000 lb
sg seawater = 1.03

W = V γ seawater

$V = \frac{W}{\gamma_{seawater}} = \frac{450000}{1.03(62.4)} = 7001.5\ ft^3$

V = lwh h = 7ft

$C_b = \frac{7}{2} = 3.5\ ft$

$I = \frac{LB^3}{12} = \frac{50(20^3)}{12} = 33333.3\ ft^4$

$y_{mc} = 8 - \frac{7}{2} = 4.5\ ft$

$y_{cb} = \frac{I}{V} - y_{mc} = \frac{33333.3}{7001.5} - 4.5 = 0.26\ ft$

Stability = 8 + .26 = 8.26ft

the barge will be stable since it is greater than 8ft