Data: 8 ft

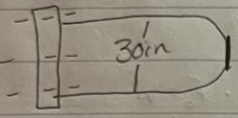
- $L_{CB} + MB > L_{cg}$
- $L_{cg} = 12$ ft $\rightarrow MB > L_{cg} - L_{CB} \rightarrow MB > 8$ ft
- $L_{CB} = \frac{8}{2} = 4$ ft

- $MB = \frac{I}{V_d} \rightarrow I = \frac{80\text{ ft} \cdot W_{min}^3}{12}$ $\searrow$ $\frac{\frac{80\text{ ft} \cdot W_{min}^3}{12}}{W_{min} \cdot 80 \cdot 8} > 8$ ft $\rightarrow W_{min} = \boxed{27.71\text{ ft}}$
- displaced volume: $V_d = W_{min} \cdot 80\text{ ft} \cdot 8\text{ ft}$ $\nearrow$

Draw Images

Module 3 HW: Ch4 (~~2~~, 10, ~~17~~, 38, 42, 54), Ch5 (~~8~~, 24, 41, 61) Nicholas Albano

4.2:



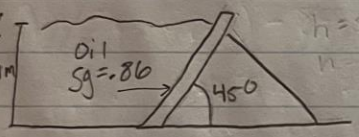
$p = +14.4$ psig $\qquad p = \frac{F}{A}$

$A = \frac{\pi}{4} d^2 = \frac{\pi}{4} \cdot 30^2 = 706.858\text{ in}$

$F = 14.4 \cdot 706.858 = 10,178.75\text{ lb}$

or 1,282,346 in each bolt

4.12:



$L = 4$m

$H = 1.4$m $\quad h = \sin\theta \cdot 1.4 = .989$m

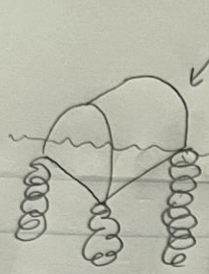
$A = b \cdot h = 4 \cdot .989 = 3.95$m

$\gamma_{oil} = .86 \cdot 9.81 = 8.436$

$F = \gamma \cdot h_c \cdot A = 8.436 \cdot .989 \cdot 3.95 = \boxed{32.95\text{ kN}}$

$= \frac{2}{3} \cdot 1.4 = \boxed{.93\text{m}}$

5.8:



$\leftarrow V = 40 in^3 = 3.3 ft$

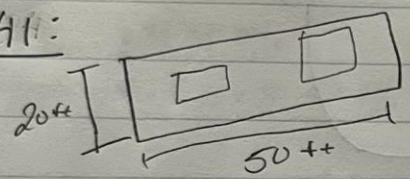
Find supporting force from spring:

$14.6(32.2) - \gamma \cdot v = F$

$470.1 - 185.3 = \boxed{284.8 \text{ lb/ft}}$

$\gamma_{oil} = .9 \cdot 62.4 = 56.16 \text{ lb/ft}^3$

5.41:



$t = 8 ft$

$W = 450{,}000 lb$

Had trouble with this problem and others.

it will be stable?

$A = 20 \cdot 50 = 1000 ft$

$\gamma_{wat} = 62.4 \text{ lb/ft}$