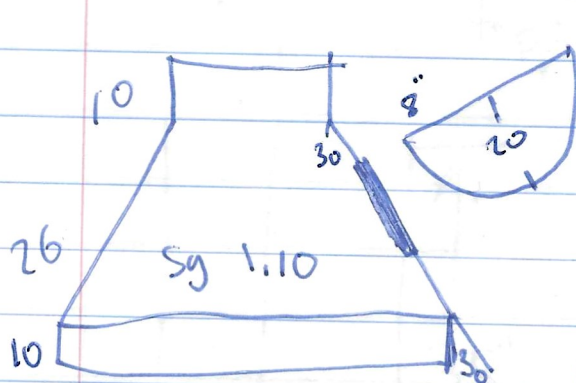


Homework 2.1

ch4 Problem 28

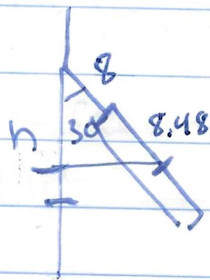


Find magnitude of force on this area

$$F = \gamma \cdot h_c \cdot A$$

$$A = \frac{1}{2} \cdot \pi r^2 = \frac{1}{2} \cdot \pi \cdot 20^2 = 628.318 \text{ in}^2$$

$$\bar{y} = \frac{y_c}{3\pi} = 8.48''$$



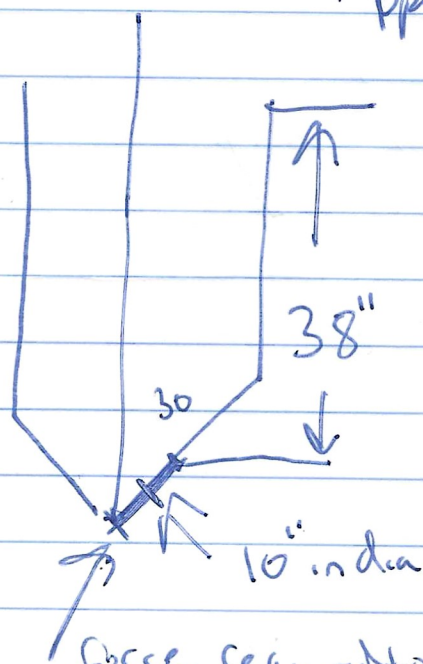
$$\cos 30 = \frac{h}{(8 + 8.48)} = 14.27 + 10 = h_c$$

$$1.1 \cdot 24.27 \cdot 628.318$$

$$F = 16775.65 \text{ psi}$$

Ch 4, 42

Calculate force with cable must pull to open the gate



$$F = \gamma \cdot h_c \cdot A$$

$$A = \pi r^2 = \pi \cdot 5^2 = 78.53 \text{ in}^2 = .5454 \text{ ft}^2$$



$$\cos 30 = \frac{h}{10} = .72 \text{ feet}$$

force required to pull up is force at the bottom of the gate

SO

$$F = 62.4 \frac{\text{lb}}{\text{ft}^3} \cdot \frac{38}{12} + .72 \cdot .5454$$

132.33 ft/lbs force to lift the gate