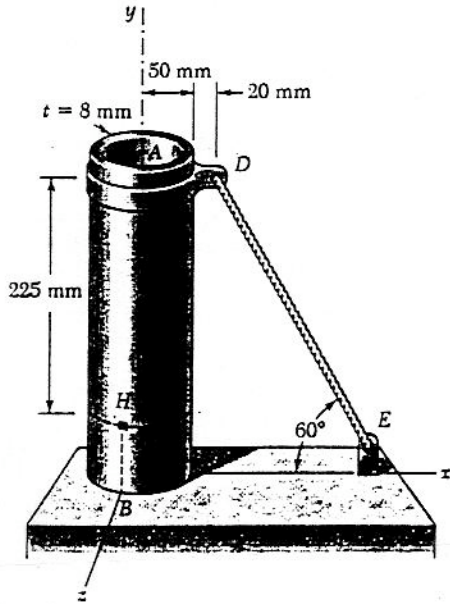
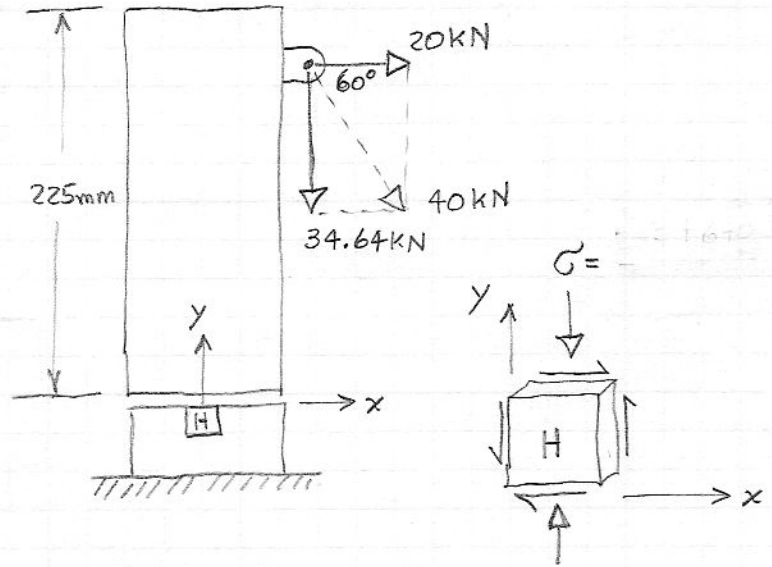


Problem 8.70

8.70 The steel pile AB has a 100-mm outer diameter and an 8-mm wall thickness. Knowing that the tension in the cable is 40 kN, determine the normal and shearing stress at point H .



Only need side view



$$d_o = 100 \text{ mm}$$

$$r_o = 50 \text{ mm}$$

$$t = 8 \text{ mm}$$

$$r_i = r_o - t = 42 \text{ mm}$$

$$A = \pi(r_o^2 - r_i^2) = 2.312 \times 10^{-3} \text{ m}^2$$

$$A = 2.312 \times 10^{-3} \text{ m}^2$$

Stresses at point H:

$$\sigma = -\frac{P}{A} = -\frac{34.64 \times 10^3}{2.312 \times 10^{-3}}$$

$$\sigma = -14.98 \text{ MPa}$$

For thin pipe

$$\gamma = 2 \frac{V}{A} = \frac{2(20,000)}{2.314 \times 10^{-3}}$$

$$\gamma = 17.29 \text{ MPa}$$