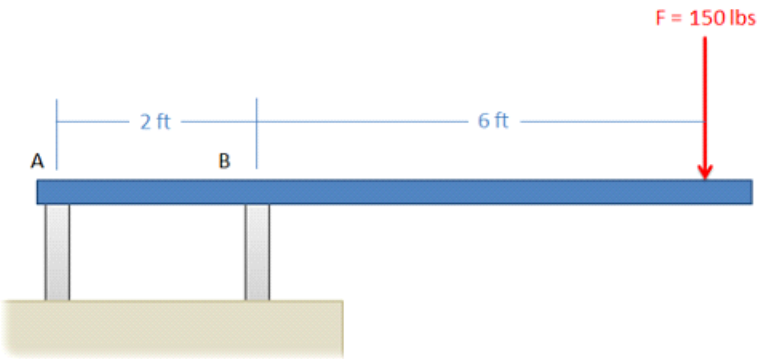
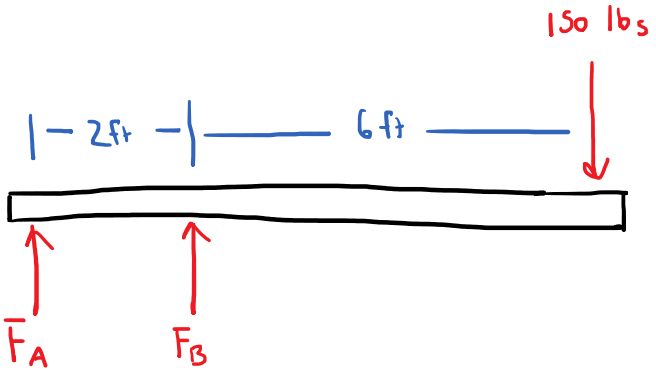
Problem 3

The diving board shown below is supported by two hollow tubes at A and two at B. If the tubes have an outside diameter of 2 inches and an inside diameter of 1.75 inches, what are the normal stresses in the tubes at A and B? (Assume each tube only carries tensile or compressive forces)



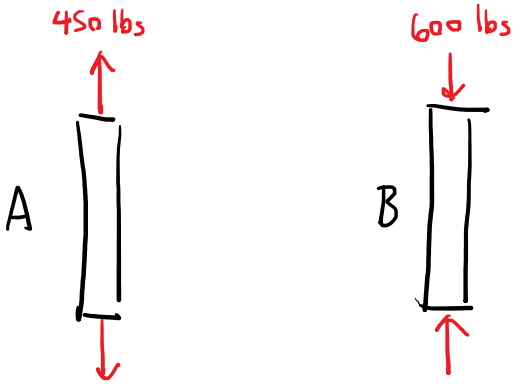


$$\Sigma F_y = F_A + F_B - 150 = 0$$

$$\Sigma M_A = (2)(F_B) - (150)(8) = 0$$

$$F_B = 600 \text{ lbs}$$

$$F_A = -450 \text{ lbs}$$



$$\sigma = \frac{N}{A}$$

$$A = (2)(\pi(1)^2 - \pi(.875)^2) = 1.47\ in^2$$

$$\sigma_A = \frac{450\ lbs}{1.47\ in^2} = \boxed{305.6\ psi\ T}$$

$$\sigma_B = \frac{600\ lbs}{1.47\ in^2} = \boxed{407.4\ psi\ C}$$