

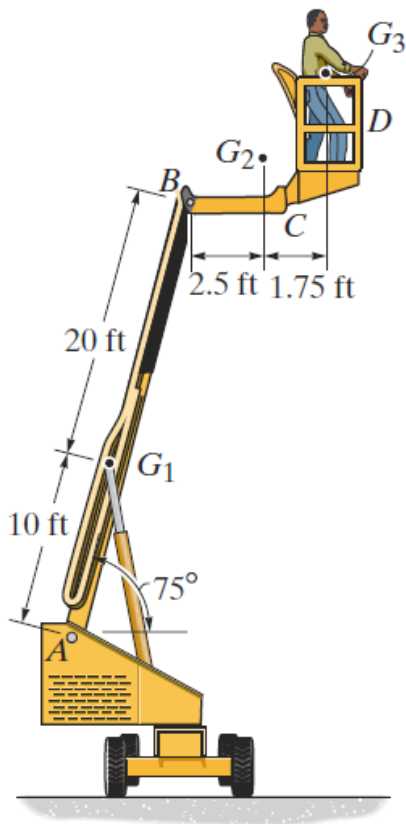
University of California, Merced

ENGR 057 Statics and Dynamics: Assignment #2

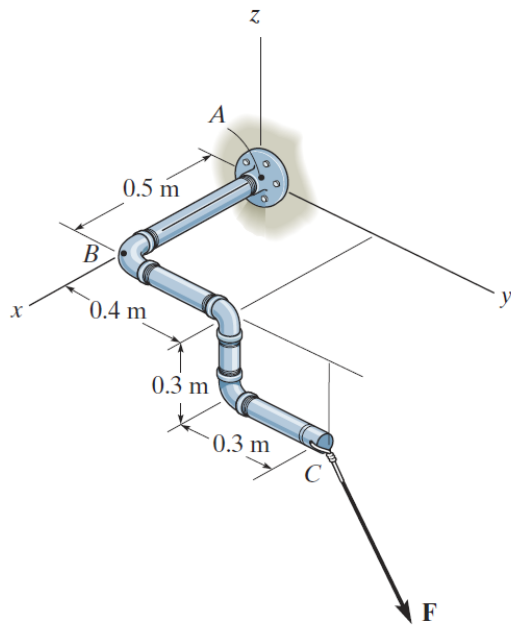
Summer - 2022

Due: July 5, 2022

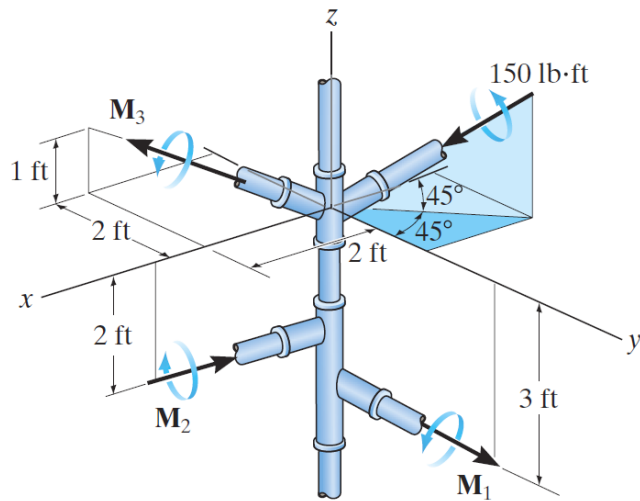
Problem 1 (20 pts). If the 1500-lb boom AB , the 200-lb cage BCD , and the 175-lb man have centers of gravity located at points G_1 , G_2 and G_3 , respectively, determine the resultant moment produced by all weights about point A .



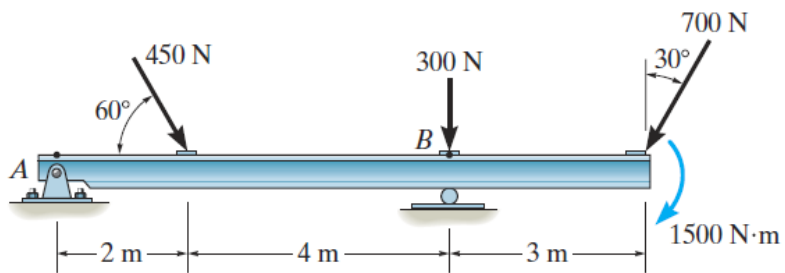
Problem 2 (20 pts). The pipe assembly is subjected to the force of $\mathbf{F} = \{600\mathbf{i} + 800\mathbf{j} - 500\mathbf{k}\}$ N. Determine the moment of this force about point A .



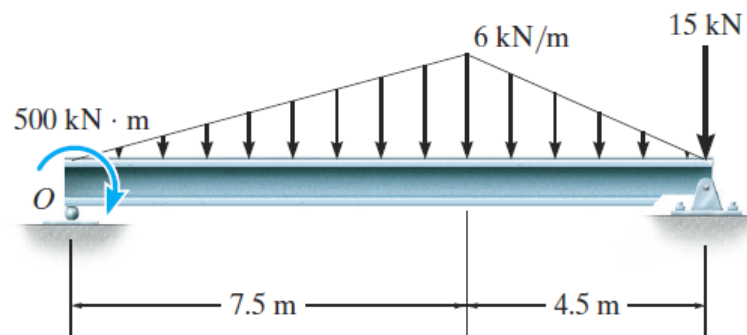
Problem 3 (20 pts). If $M_1 = 180 \text{ lb}\cdot\text{ft}$, $M_2 = 90 \text{ lb}\cdot\text{ft}$, and $M_3 = 120 \text{ lb}\cdot\text{ft}$ determine the magnitude and coordinate direction angles of the resultant couple moment.



Problem 4 (20 pts). Replace the loading acting on the beam by a single resultant force. Specify where the force acts, measured from end A .



Problem 5 (20 pts). Replace the loading by a single resultant force, and specify the location of the force measured from point O .



Bonus Problem (15 points). Determine the magnitude of the moment of the 200-N force about the x axis. Solve the problem using both a scalar and a vector analysis.

