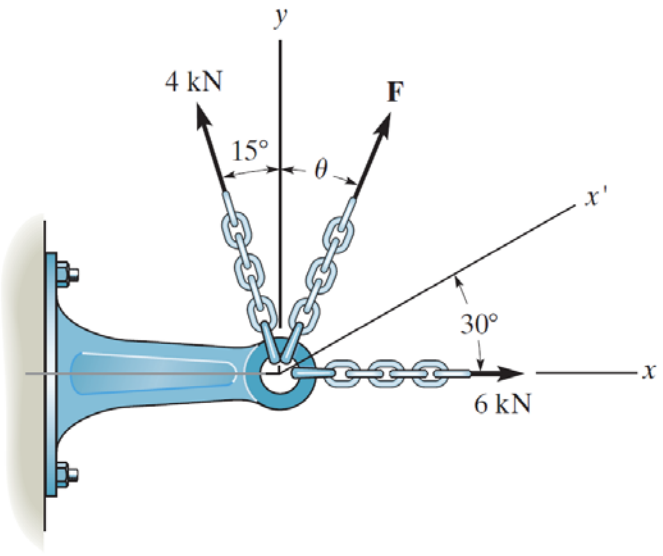
University of California, Merced

ENGR 057 Statics and Dynamics: Assignment #1

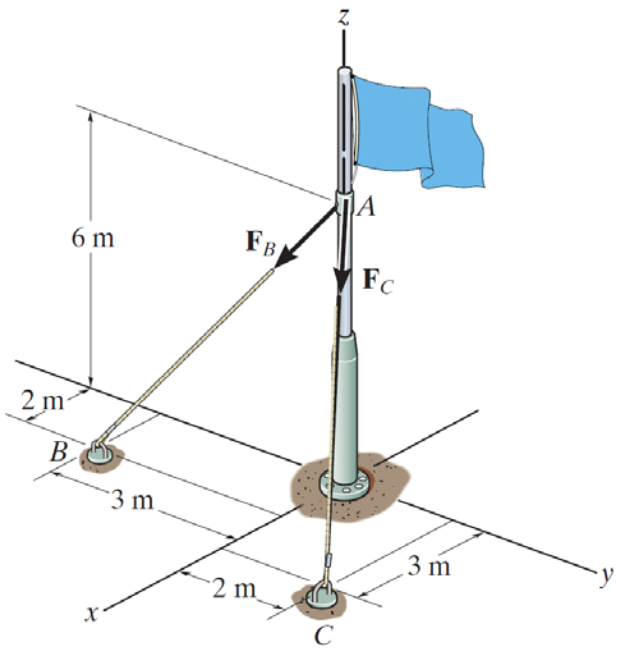
Summer - 2022

Due: June 28, 2022

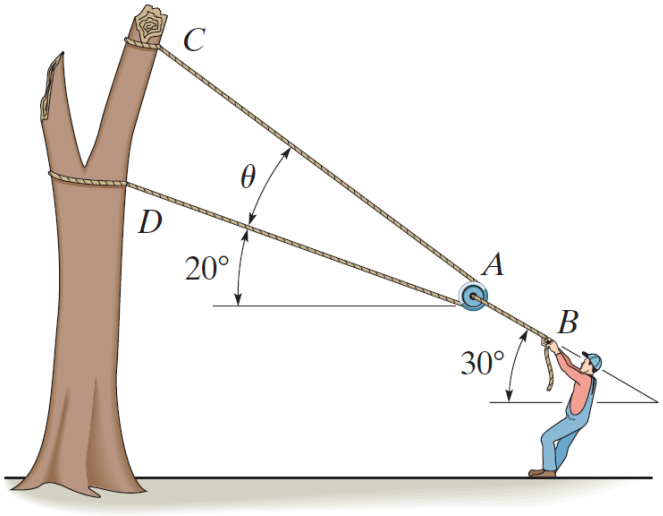
Problem 1 (20 pts). Three forces act on the bracket. Determine the magnitude and direction θ of **F** so that the resultant force is directed along the positive *x*' axis and has a magnitude of 8 kN.



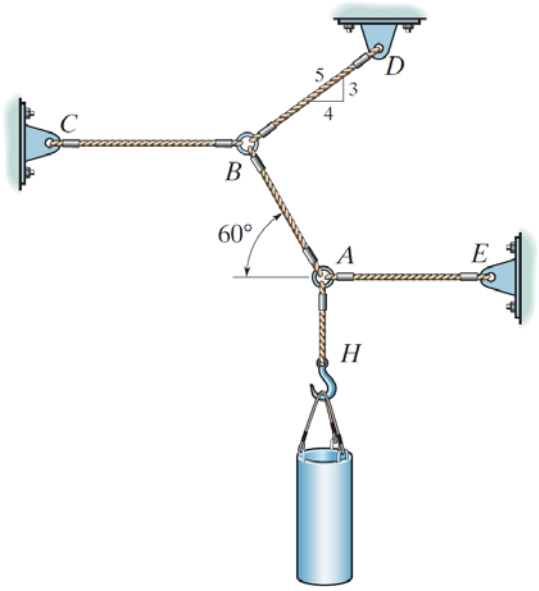
Problem 2 (20 pts). If F_B = 700 N, and F_C = 560 N, determine the magnitude and coordinate direction angles of the resultant force acting on the flagpole.



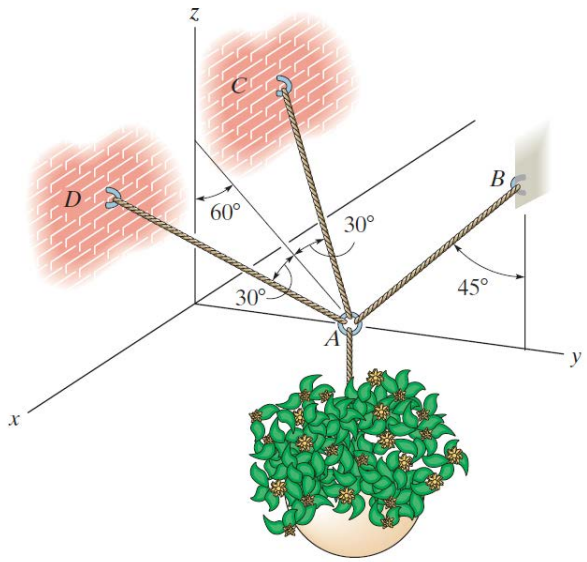
Problem 3 (20 pts). The man attempts to pull down the tree using the cable and *small* pulley arrangement shown. If the tension in *AB* is 60 lb, determine the tension in cable *CAD* and the angle θ which the cable makes at the pulley.



Problem 4 (20 pts). The 30-kg pipe is supported at *A* by a system of five cords. Determine the force in each cord for equilibrium.



Problem 5 (20 pts). If each cord can sustain a maximum tension of 50 N before it fails, determine the greatest weight of the flowerpot the cords can support.



Bonus Problem (10 points). Use sine law or cosine law to solve the bonus problem:

If F_1 = 30 lb and F_2 = 40 lb, determine the angles θ and ϕ so that the resultant force is directed along the positive x-axis and has a magnitude of F_R = 60 lb.