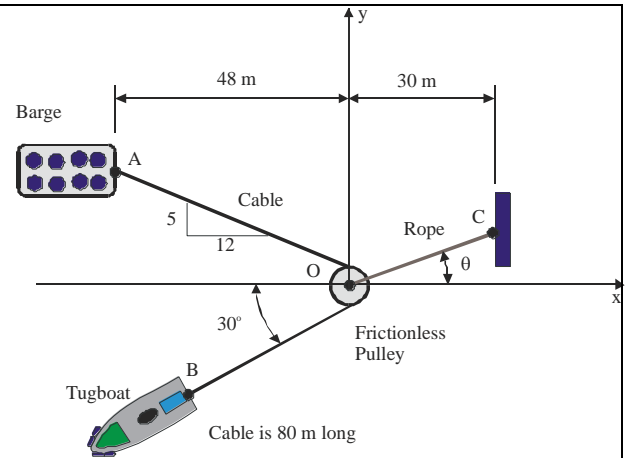


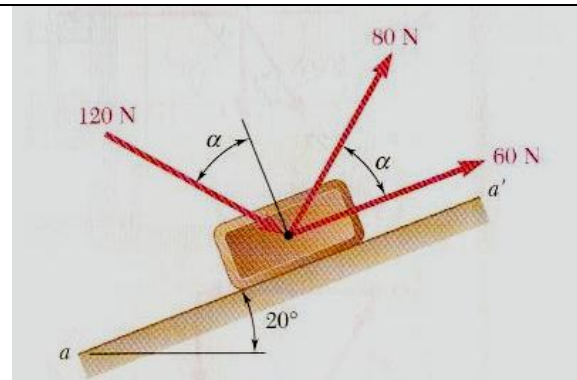
Engineering Statics Assignment #2

1) A tugboat is pulling a barge with a 80 m long cable in the configuration shown in the figure. The cable is attached to the barge at A and wraps around a frictionless pulley and is attached to the tugboat at B . (Neglect the radius of the pulley.) The pulley is attached to the dock by the rope OC . The cable breaks when the tension in the cable reaches 1000 N .

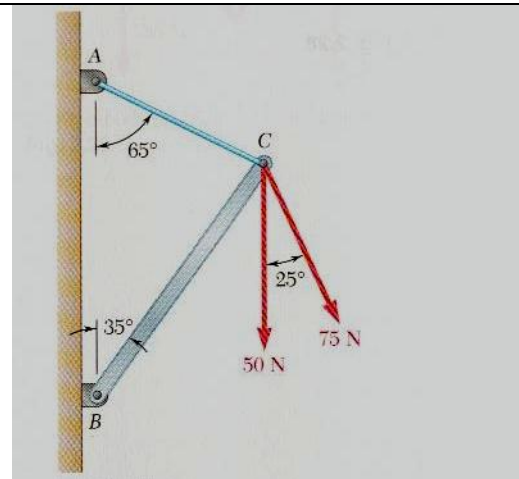
Determine the tension in the rope OC and the angle θ at the instant the cable breaks using, rectangular components



1) Knowing $\alpha = 40^\circ$, determine the resultant of the three forces shown using rectangular components.



2) Determine the required tension in cable AC , knowing that the resultant of the three forces exerted at point C of the boom BC must be directed along BC , and the corresponding magnitude of the resultant using rectangular components.



4) A mass, m , is suspended from a circular ring that is attached to supports by cables AB and AC as shown in the figure. The force in cable AB is 538.5 N.

Knowing that the point A is in equilibrium, determine the mass, m and the magnitude of the force in cable AC by each of the following methods using rectangular components

Note: $g = 9.8 \text{ m/sec}^2$

Also, the coordinates of B are $(-500, 200) \text{ mm}$

