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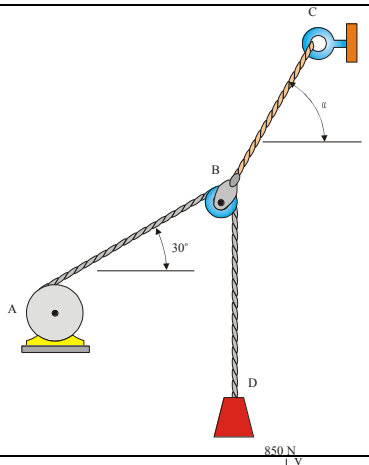
NAME:_____Student #_____ GROUP:_____

ENG 1440 Assignment #3

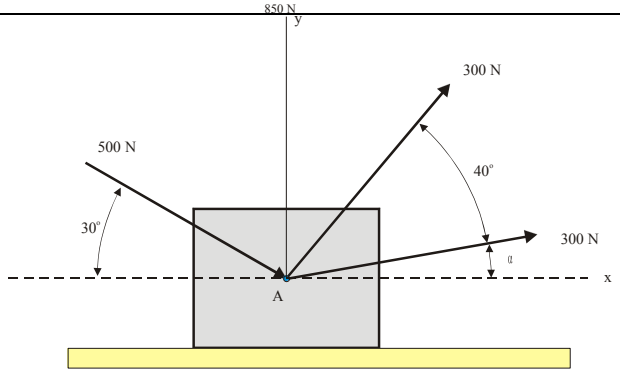
1. An *850 N* weight is being hoisted as shown. Determine the angle α for which the weight will be in equilibrium.



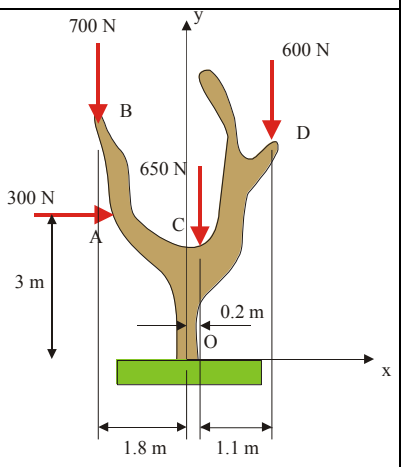
2. Two *300 N* forces and a *500 N* force are applied to the block at point *A* as shown in the figure. All of the forces are in the *x*-*y* plane.

a) If angle $\alpha = 20^o$ determine the magnitude and direction of the resultant force exerted at the point *A*.

b) Determine the value of the angle α for which the resultant of the three forces is in the *x* direction.



3. Three boys are sitting in a tree when the wind is blowing. The boys exert forces of *700 N*, *650 N* and *600 N* on the tree at the locations shown in the figure. The wind force is *300 N*. Replace the forces with a single force and a couple applied at *O*.



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BONUS:
Three cables pull on the pipe such that they create a resultant force having a magnitude of 900 N. If two of the cables are subjected to known forces, as shown in the figure, determine the direction of the third cable so that the magnitude of force **F** in this cable is a *minimum*. All forces lie in the *x*–*y* plane. What is the magnitude of **F**?
Hint: First find the resultant of the two known forces.