Name:……………………………………………………………   No.:……..……….

Birzeit University - Faculty of Engineering
Department of Civil Engineering
Statics - ENCE232
HW#2: (Submission Deadline – 09/03/2017)
Instructors: *Abdelrahman Hamdan* 2st *Semester 2016/2017*

Q1. Five forces act on a link in the gear-shifting mechanism of a lawn mower. The vector sum of the five forces on the bar is zero. The sum of their moments about the point where the forces Ax and Ay act is zero.
(a) Determine the forces Ax, Ay, and B.
(b) Determine the sum of the moments of the forces about the point where the force B acts.
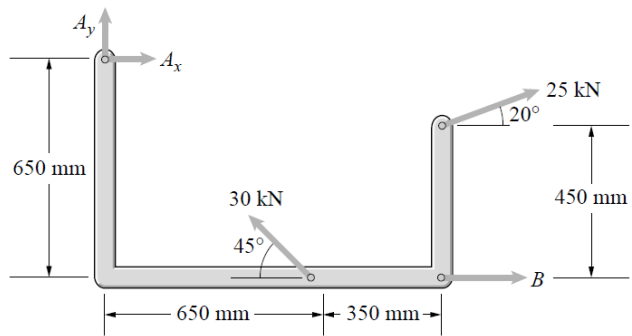
Q2. The mass m = 70 kg. What is the moment about A due to the force exerted on the beam at B by the cable?
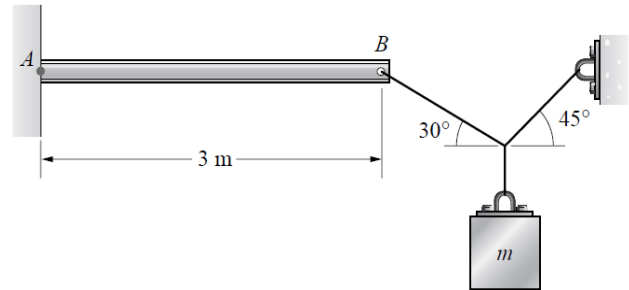
Q3. Using the principles to be developed in Chapter 4 on equilibrium, one can determine that the tension in cable AB is 143.4 N. Determine the moment about the x-axis of this tension force acting on point A. Compare your result with the moment of the weight W of the 15-kg uniform plate about the x-axis. What is the moment of the tension force acting at A about line OB?
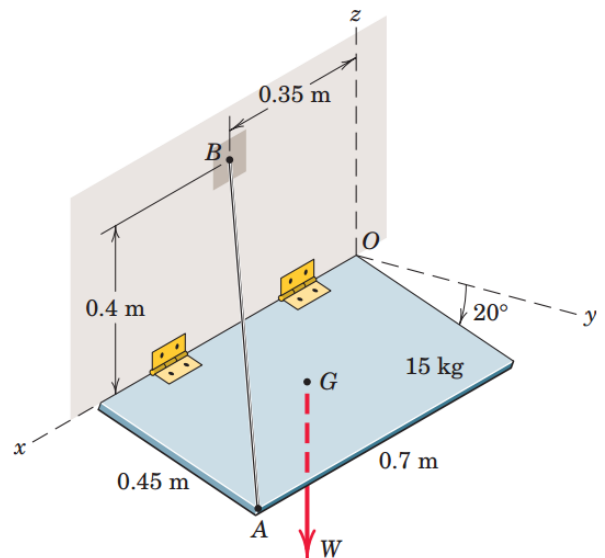
Q4. The cables AB and AC extend from an attachment point A on the floor to attachment points B and C in the walls. The tension in cable AB is 10 KN, and the tension in cable AC is 20 kN. What is the sum of the moments about O due to the forces exerted on the attachment point A by the two cables?
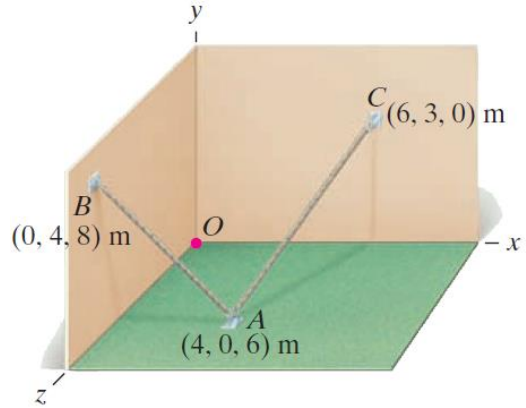
Q5. The weight W causes a tension of 100 lb in cable CD. If d = 2 ft, what is the moment about the z axis due to the force exerted by the cable CD at point C?
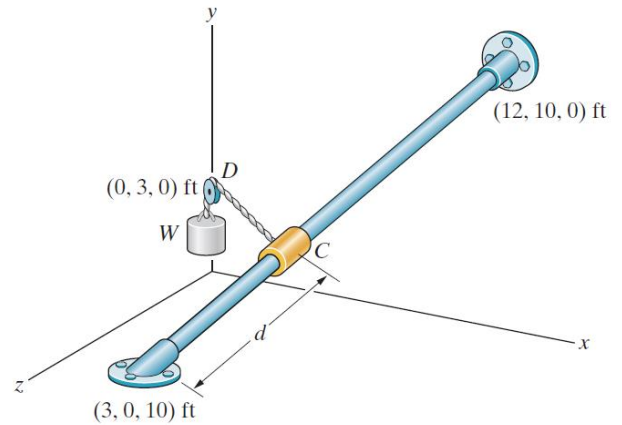
Q6. The y axis points upward. The weight of the 4-kg rectangular plate acts at the midpoint G of the plate. The sum of the moments about the straight line through the supports A and B due to the weight of the plate and the force exerted on the plate by the cable CD is zero. What is the tension in the cable?
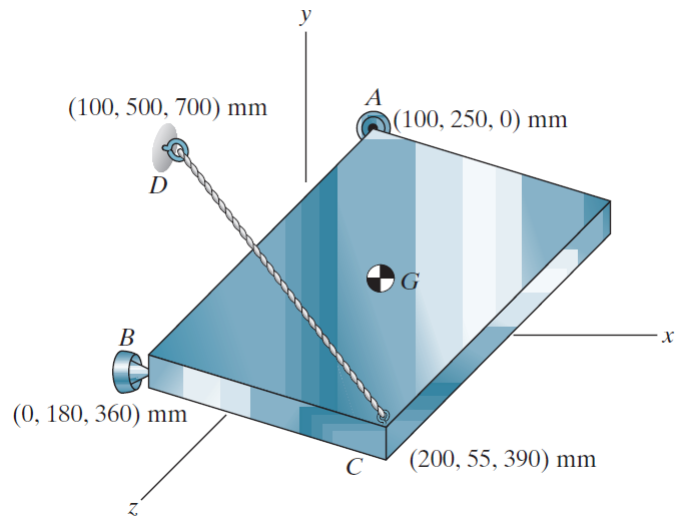
Q7. What is the moment of the force F about the axis of the bar BC?

y

C $(0, 4, 0)$ m

$\mathbf{F} = -2\mathbf{i} + 6\mathbf{j} + 3\mathbf{k}$ (kN)

$A\ (4, 2, 2)$ m

x

B

$(0, 0, 3)$ m

z