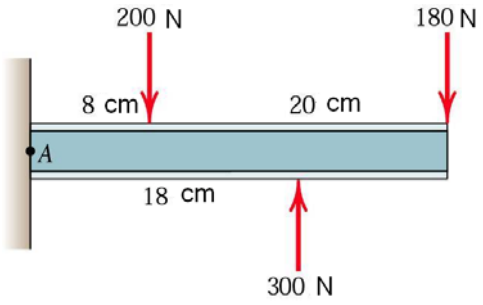
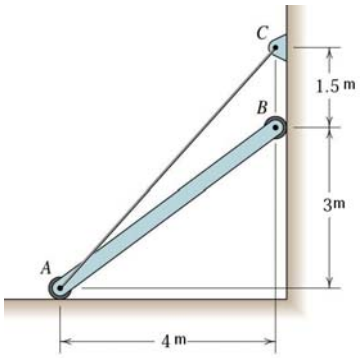
GE 210 Engineering Mechanics
1st Semester 1425/1426 H
Midterm Exam I

Time allowed: 1 hr 30 min.

Problem (1)

a) Reduce the given loading on the beam to a force-couple system at point A.
b) If the system is to be reduced to a single resultant force, determine the distance *x* to the right of point A at which this single resultant force acts.





Problem (2)

The uniform bar AB with end rollers has a mass of 30 kg and is supported by the smooth horizontal and vertical surfaces and by the wire AC.
Draw a free body diagram of AB then calculate:

a) the tension T in the wire
b) the reactions at the rollers A and B.

Problem (3)

a) Determine the coordinates $(\bar{x}, \bar{y})$ of the centroid C of the Z-section with respect to the (x,y) axes shown, then
b) Find the area moments of inertia of the section about the centroidal axes (x_0, y_0) parallel to (x,y) axes.