مدينة زويل للعلوم والتكنولوجيا
Zewail City of Science and Technology

ZEWAIL CITY
ESTABLISHED 2000
INAUGURATED 2011

مشروع مصر القومي للنهضة العلمية
Egypt's National Project for Scientific Renaissance

Spring-2018 Phys101
Assignment 11
Check MateringPhysics for other problems
Due date: 05 May 2018.

Discussion questions

1-Why is it easier to hold a 10-kg dumbbell in your hand at your side than it is to hold it with your arm extended horizontally?

2- When lifting a heavy object, why is it recommended to keep the back as vertical as possible, lifting from the knees, rather than bending over and lifting from the waist?

3- A ladder is resting inclined against a wall. Would you feel safer climbing up the ladder if you were told that the ground is frictionless but the wall is rough or that the wall is frictionless but the ground is rough? Justify your answer.

Problems

4- A uniform, 255-N rod that is 2.00 m long carries a 225-N weight at its right end and an unknown weight W toward the left end (see figure). When W is placed 50.0 cm from the left end of the rod, the system just balances horizontally when the fulcrum is located 75.0 cm from the right end.

(a) Find W.

(b) If W is now moved 25.0 cm to the right, how far and in what direction must the fulcrum be moved to restore balance?

5- A carpenter's square has the shape of an L, as shown below. Locate its center of gravity.
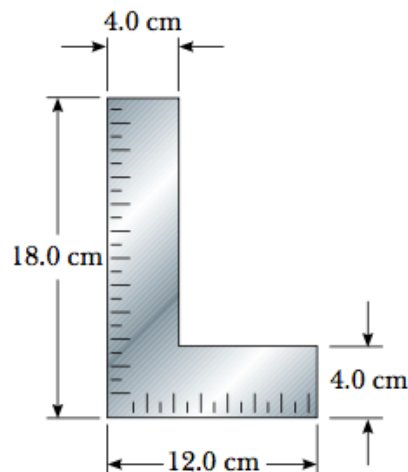
6- A 1200-N uniform beam is supported by a cable, as illustrated below. The beam is pivoted at the bottom, and a 2000-N object hangs from its top. Find the tension in the cable and the components of the reaction force exerted on the beam by the floor.
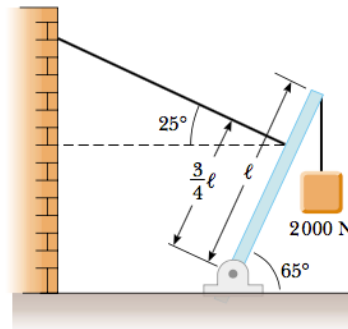
7- A metal rod that is 4.00 m long and 0.50 cm^2 in cross-sectional area is found to stretch 0.20 cm under a tension of 5000 N. What is Young's modulus for this metal?

8- Find the weights A,B, and C for the following structure to remain in balance. The strings and rods have negligible weight, and the rods are to hang horizontally.