

You may answer as many questions as you like. You only have 1 hour to finish this section.

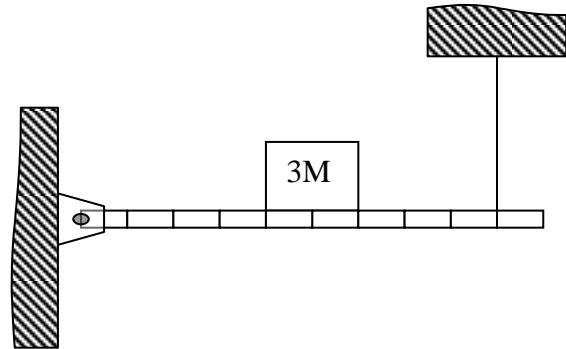
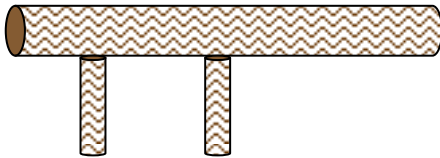
You must do a minimum of **60** points on this section.

The numbers in parentheses after the problem indicate how many points the problem is worth.

You may not start part B until you have finished this part.

Note that some problems have instructions for the reasons.

A1. Find the tension in the cord in the diagram to the right. The bar has a mass of  $m$ . Your reason should be a free body diagram. (20)



A2. Hoak is designing a new element for project adventure as is shown to the left. The log has a mass of 300 kg and is 6.00 m long. The supports are spaced evenly under half the log.

What are the forces on each of the supports in this element? Your reason should be a free body diagram for this problem. (20)

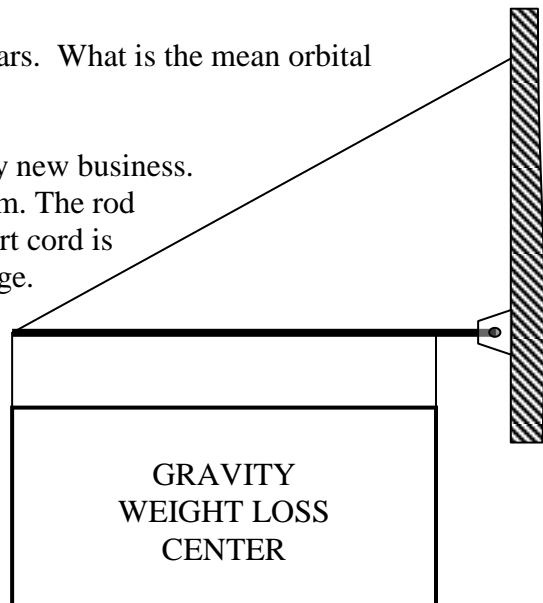
A3. When the moon is directly overhead how much are you attracted to the moon? (20)

A4. The comet Phun orbits our Sun once every 246 years. What is the mean orbital radius around the Sun for this comet? (20)

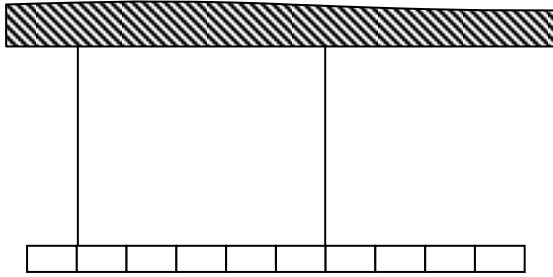
A5. I plan to put the sign shown to the right outside my new business.

The sign has a mass of 8.50 Kg and is 1.00 m by 2.00 m. The rod has length of 2.15 m and a mass of 750.0 g. The support cord is attached to the wall a distance of 1.40 m above the hinge.

What is the tension in the support cord? Your reason for this problem should be a free body diagram. (30)



A6. A newly discovered planet has a mass five times that of Earth and a radius four times that of Earth. What is the acceleration due to gravity on the surface of this planet? (10)



A7. What is the tension in each of the cords in the diagram shown to the left? The bar has a weight of 20.0 N. Your reason for this problem should be a free body diagram. (20)

A8. A traffic light is hung from 2 cords each of length 5.00 m that are attached to supports that are 6.00 m apart. The traffic light has a mass of 12.0 kg and the cords are light. What is the tension in each of the cords? Your reason for this problem should be a free body diagram. (20)

A9. Using weights of 1,2,4,5,6,7,8,9,10,15 balance the problem on the bottom of this page. Put solution in the diagram. (SO)(40)

