Unit 4 Sample Homework 4

1. A cherry picker is a utility truck that is used to access power and phone lines. Suppose such a truck can be modeled as single object with its mass located in two distinct locations: mass M is positioned halfway between the headlights, and mass m is located in the cherry picker. It is supported by the ground by its two tires.

2W

D

Mass = m

Mass = M

a. Draw a FBD of the truck.

b. If mass m becomes large enough, the truck with tip to the left. Develop a relationship that expresses distance D in terms of m, M, W, g.

c. If distance D needs to be 4 times the width of the truck, how much more massive does the truck need to be than the utility worker?

2. Find the net moment that the 150 N force creates around Point P

3 m

2 m

60o

150 N

Pt. P

2.0 m

200 N

Pt. A

100 N

2.0 m

2.0 m

2.0 m

30o

3. Given the beam at right, find the forces acting at Pt. A and at the far right end to keep the beam in equilibrium

??? N

3 m

2 m

60o

150 N

Pt. P