Physics 2204
Work Sample - Component Forces

Name:_____

1. A caretaker mows the lawn by pushing the mower with a force of 125 N along the line of the handle. If the handle makes and angle of 65.0º with the ground, what is the force component pushing the mower forward?

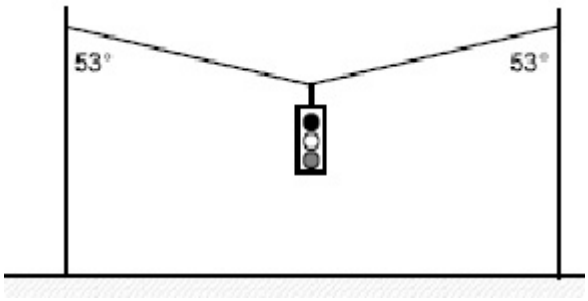
2. Find the horizontal and the vertical components of a 275 N force that makes an angle of 68.0º with the horizontal?

3. A car has become stuck and is to be towed using a cable that makes an angle of 55.0º above the horizontal. The 3.00×10^3 N force from the winch is directed along the cable. Calculate the horizontal and vertical components of the force.

4. Two children playing on a beach are pulling on an inner tube. One exerts a force of 45 N [N]. The other exerts a force of 71 N [S 38º E]. What is the net force acting on the inner tube?

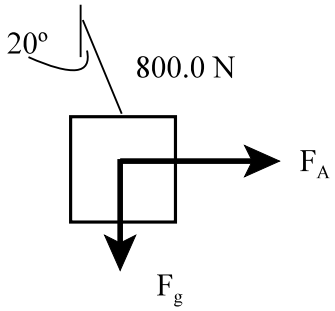
5. Two boys attach ropes to a wagon so that they can pull it together. If one exerts a force of 85 N [N 30º E] and the other exerts a force of 85 N [N 30º W], what is the net force acting on the wagon? What is the equilibrant force?

6. A street lamp weighs 150 N. It is supported equally by two wires that form a 120º angle. What is the tension in each wire? (Draw an FBD)

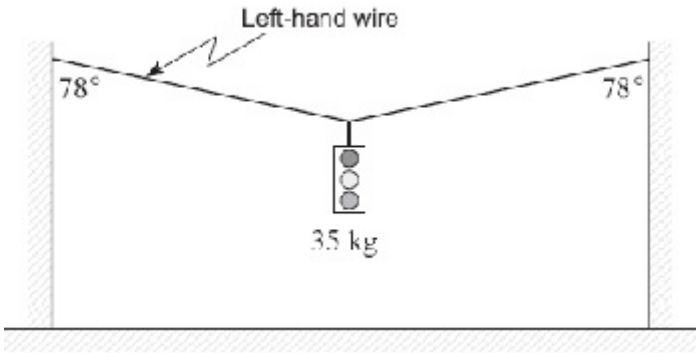


7. A 600.0 N gymnast grasps a chin-up bar and hangs vertically. The angle formed by her arms is 55º. What is the strain on the muscles in each arm? (Draw an FBD)

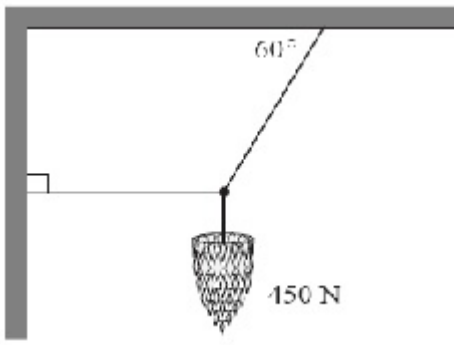
8. Julia is sitting in a swing and Mike is pulling her backwards at an angle of 20º. The tension in the ropes is 800.0 N. What is Julia's weight? What force are you exerting? (Draw FBD)



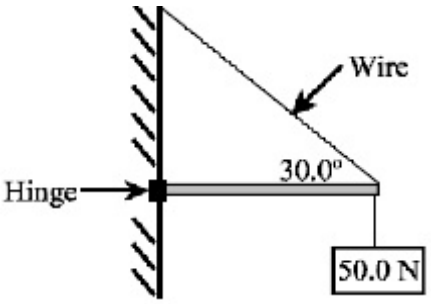
9. A 35 kg traffic light is suspended by two wires as shown. What is the tension in the left-hand wire? (Draw FBD)



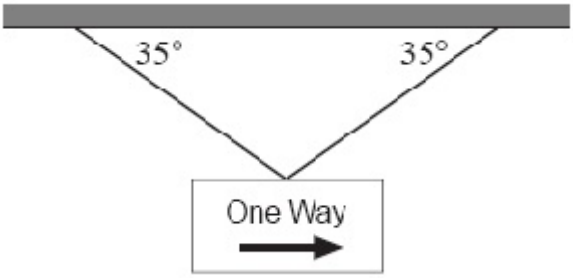
10. A 450 N chandelier is supported by three cables as shown in the diagram. What is the tension in the horizontal cable?



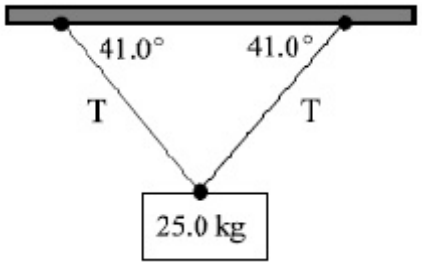
11. The wire below supports a horizontal massless beam. What is the tension in the wire?



12. A traffic sign hangs from two cables as shown. If the tension in each cable is 220 N, what is the weight of the sign?



13. For the suspended mass shown below, what is the magnitude of the tension, T, in each cable?



14. A traffic light is held stationary by two wires as shown below. What is the mass of the traffic light if the tension in each wire is 235 N?