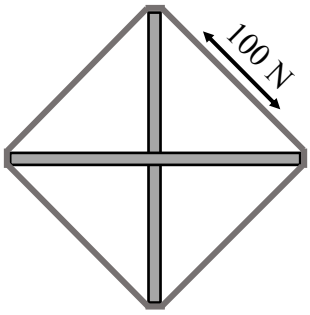
PHYS 1110 Group Work Sheet
Newton's second law

With your group, discuss how to answer these questions and write your group answer in the space provided.

1. A set of identical crossed bars at right angles is wrapped with a strap tightened to a tension of 100 newtons. We want to find the magnitude of the compression in the bars.



   a. Draw a free body diagram for one end of one bar.

   b. What force of compression will equilibrate the tension from the strap?

2. A 700-kg rocket initially accelerates upward from its launch pad at a rate of 0.11 m/s^2.

   a. What is the net force on the rocket?

   b. What forces act on the rocket?

   c. What is the weight of the rocket?

   d. What is the magnitude of the force of thrust on the rocket form its engine?

3. A 1500-kg full of circus clowns travels on pavement at a speed of 30. m/s. The car has rubber tires, coefficient of static friction $\mu_s = 0.80$ and coefficient of kinetic friction $\mu_k = 0.50$.

   a. What is the car's weight?

   b. What is the normal force on the car?

   c. If the car brakes, what is the maximum force of static friction acting on the tires?

   d. What is the maximum (backwards) acceleration of the car?

   e. If the driver brakes gently, so that the car accelerates (backwards) at a rate of 0.50 m/s^2, what is the magnitude of the force of static friction on the tires?

   f. A 20,000-kg truck carrying circus elephants drives on the same road, also on rubber tires with $\mu_s = 0.80$. If it brakes, what is its maximum (backwards) acceleration?

   g If the driver brakes hard, so that the car locks its tires and goes into a skid, what is its acceleration?