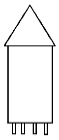
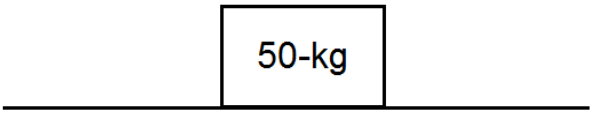
# Newton's Second Law of Motion Problems

1. A 5.0 kg toy rocket is acted upon by a 59 N force pushing it up (supplied by its engine). What is the rocket's acceleration?



2. A 250 N force is used to slide a 50 kg crate across a horizontal floor at a speed of 4 m/s.
    a. What is the magnitude of the frictional force?
    b. What is the coefficient of kinetic friction between it and the crate?

3. A 50-kg wooden crate on a wooden floor is being pushed by a worker using 200-N of force to the right. What will the acceleration of the crate be?



4. A 15,000-kg truck moving at 30 m/s (≈ 60 mph) sees a fake rabbit on the road ahead of him and slams on the brakes. If the brakes exert an average force of 30,000-N, then (a) how far will the truck travel before coming to a complete stop? (b) How much time will it take to stop?

5. A 1.5 kg block slides down a *frictionless* incline plane making an angle of 20° with the horizontal.
    a. Draw all the forces acting on the block.
    b. Calculate the weight of the block in newtons.
    c. Find the parallel component of the weight.
    d. Find the acceleration of the block.