Mechanics 2

1. Rank the following from highest pressure to lowest pressure upon the ground:
   - the atmosphere at sea level,
   - a 7000-kg elephant with total area 0.5 m^2 in contact with the ground,
   - a 65-kg lady in high heels with total area 0.005 m^2 in contacting with the ground,
   - a 1600-kg car with a total tire contact area of 0.2 m^2.

2. What is the momentum of a 1.5 t car going at highway speed of 100 km/h?

3. During the Powerhouse lab, Jerome runs up the stairs, elevating his 102 kg body a vertical distance of 2.29 meters in a time of 1.32 seconds at a constant speed.
   a) Determine the work done by Jerome in climbing the stair case.
   b) Determine the power generated by Jerome.

4. Suppose that a sled is accelerating at a rate of 2 m·s^{-2}. If the net force is tripled and the mass is halved, then what is the new acceleration of the sled?

HW. An air pressure of 100,000 Pascals is exerted on a stack of three textbooks, where each book has an area of 0.035 m² and a combined mass of 5 kg. What is the total force acting on the stack of books from both the atmospheric pressure and the weight of the books?