

## Physics 112 – Forces Test Review WS

1. Use the concept of inertia to describe why you would hurt your hand if you caught a softball as opposed to a ping pong ball.
2. Describe how the two forces of friction affect an object's motion as you slowly increase the applied force on an object at rest on the floor. Your response should include what causes friction, the difference between static and kinetic, and what the coefficient of friction represents.
3. Buzz Aldrin's weight measured on the moon (where  $g = 1.62 \text{ m/s}^2$ ) was recorded to be 129.6 N. What would Aldrin's weight be on: i) earth? ii) Mars? iii) Jupiter?
4. A FedEx worker is able to get a box just into motion by pushing on it with a horizontal force of 21.2 N. If the coefficient of static friction between the box and the truck's floor is 0.17, determine the mass of the box.
5. A team of Huskies are able to pull a sled carrying a group of children at constant speed with a horizontal force of 172.1 N.
  - a. If the collective mass of the sled and children is 125.2 kg, what is the coefficient of kinetic friction between the sled and the snow?
  - b. If the coefficient of static friction between the sled and snow was measured to be 0.24, what was the initial force required to get the children moving?
6. A tractor is pulling a 432.5 kg wagon of hay across the field with a horizontal force of 1648.0 N. If the coefficient of kinetic friction between the wheels of the wagon and the field is 0.27, determine: a) the net force (if any) acting on the wagon.
7. A 118kg box is pulled at a constant velocity with an applied force of 615N.
  - a. Calculate the force of friction
  - b. Calculate the normal force on the crate
  - c. Calculate the coefficient of kinetic friction
8. A 32.5kg box is pressed up against the wall using an applied force of 755N. For the box not to fall, calculate the minimum coefficient of static friction necessary between the wall and the box.

ANSWERS: 3) i) 785.1 N, ii) 297.6 N, iii) 2072 N, 4)  $m = 12.7 \text{ kg}$ , 5)  $\mu = 0.14$ ,  $F_A = 294.9 \text{ N}$ , 6)  $F_{\text{net}} = 502.0 \text{ N}$  7)  $\mu = 0.53$  8)  $\mu = 0.42$