# Newton's Laws

Name: _____

1. Okay, a small insect smashes into the windshield of your car while you are zooming down the interstate. (a) Which exerts the larger force: the bug on the car or the car on the bug? So, how come? (b) Which experiences a larger acceleration; the bug or the car? How come?

2. An ultra low friction pulley deal is as shown. The two weights experience an acceleration of 0.450 m/s$^2$. Find the mass of the second weight.

   $a$ ↑   □ 1.08 kg
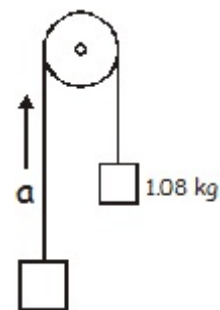
3. A big dump truck is at rest on a section of road that is at an angle of 5.00° to the horizontal. The truck's mass is 15 500 kg. What force must the brakes exert to keep the truck from rolling down the sloped road?

**4.** Three masses are connected by a light string that passes over a frictionless pulley as shown. (a) What is the acceleration of the system? (b) What are the tensions in the strings?

4.05 kg    6.50 kg

2.40 kg
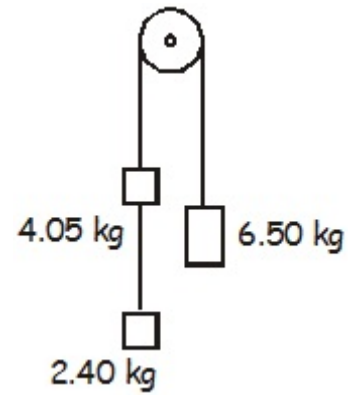
**5.** A soccer ball is kicked at an angle of 32.5° with a velocity of 21.5 m/s. (a) draw a FBD of the thing. Good, now find: (b) the time of flight for the soccer ball, (c) the distance the ball travels, and (d) the height of the soccer ball after 1.50 s.

**6.** Find the tension in each cable supporting the 600.0 N cat burglar.

37.0°