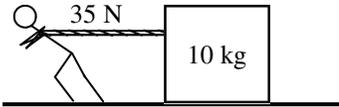
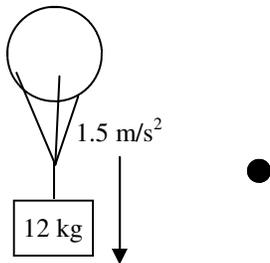


## 2012 PreAP Forces 6

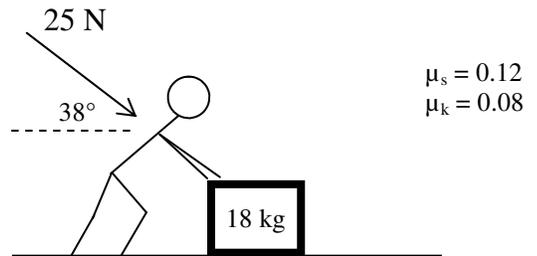


1. Slim Jim pulls with 35 N on a 10 kg box across the floor at constant speed. There is friction.
  - A. On the dot, draw all of the forces acting on the box.
  - B. \* Since it is at constant speed, what is  $a_x$ ?
  - C. In the x-direction, solve for the force of friction on the box.



2. A 12 kg box is suspended by a balloon. It accelerates downward at  $1.5 \text{ m/s}^2$ .
  - A. On the given dot, draw a force body diagram of the mass (not the balloon).
  - B. \* Calculate the tension in the rope.

3. Slim Jim is pushing down on a 18 kg box with 25 N at an angle of  $38^\circ$ .
  - A. Which is stronger Jim's force on the box or the box's force on Jim?
  - B. \* After drawing a force diagram, calculate the normal force and forces of friction on the box. (See HW 4 for a step-by-step walkthru).



- C. Decide if the box will slide or not.
  - D. Calculate how much additional force is necessary to move the box OR the acceleration of the box.
4. A 26 kg object weighs 180 N on the planet Zorg.
    - A. Write the equation for weight.
    - B. What is the mass of the object on the earth?
    - C. What is the mass of the object on Zorg?
    - D. What is the acceleration due to gravity on Zorg? (What is "g", also known as the gravitational field?)

1B)  $a_x = 0 \text{ m/s}^2$

2B) 102 N

1F) 0.35 (no units)

3B)  $F_n = 195.4\text{N}$ ;  $F_s = 23.4 \text{ N}$