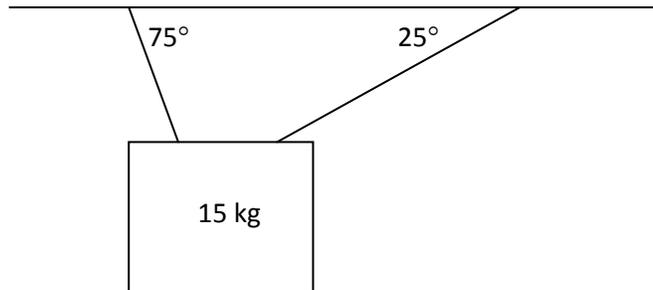
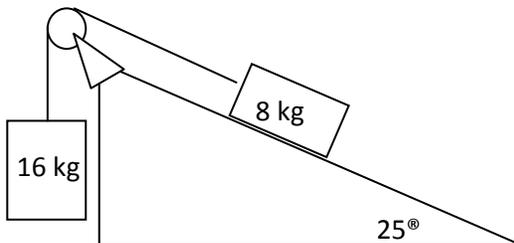


## Forces Review Problems

- A 52 N sled is pulled across a cement sidewalk at a constant speed.
  - A horizontal force of 36 N is exerted. What is the coefficient of sliding friction between the sidewalk and the metal runners of the sled?
  - Suppose the sled now runs on packed snow. The coefficient of friction is now only 0.12. If a person weighing 650 N sits on the sled, what force is needed to slide the sled across the snow at a constant speed?
- A spring scale hangs from the ceiling of an elevator. It supports a package that weighs 25 N.
  - What upward force does the scale exert when the elevator is not moving?
  - What force must the scale exert when the elevator and object accelerate upward at  $1.5 \text{ m/s}^2$ ?
- A trunk with a mass of 45 kg is resting on a plane inclined at 30 degrees from the horizontal.
  - What is the normal force?
  - What is the coefficient of static friction between the trunk and the incline plane?
  - Once the coefficient is in motion, the coefficient of friction between the trunk and incline is 0.50, how fast is the trunk accelerating?
- A 5 kg block is being pulled up a 30 degree inclined plane. The coefficient of static friction is 0.4 and the coefficient of friction is 0.3.
  - If it is pulled up the inclined plane at a constant speed, what force is required to pull the block?
  - If the block is in motion and you pull with a force of 45 N, how fast will the block accelerate?
  - If the initial velocity is 2 m/s, how fast is the block moving after 2 m?
- Find the tensions in each of the wires.



- Find the tension and acceleration of the system of objects if the coefficient of friction is 0.3.



Answers:

- 1) 0.69, 84 N;
- 2) 2) 25 N, 29 N;
- 3) 3) 382 N, 221 N, .0.577, .656  $\text{m/s}^2$ ;
- 4) 4) 37.2 N,  $1.55 \text{ m/s}^2$ , 3.2 m/s;
- 5) 5) 135 N, 38.6 N;
- 6) 6)  $4.26 \text{ m/s}^2$ , 88.6 N