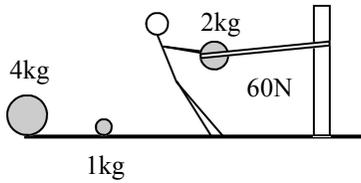


2009 Forces 6



1. Slim Jim makes a giant slingshot that can provide 60N of force. He launches three objects: 1 kg; 2 kg; 4 kg.

A. Calculate the acceleration for each mass.

1 kg

2 kg

4 kg

B. Which mass has the smallest acceleration?

C. Which mass has the largest acceleration?

2. Slim Jim is also a cave explorer (known as a spelunker). A mining company asks our famous spelunker to explore part of their gold mine. Slim Jim is a slim 60 kg and the bucket is a hefty 980 kg.

A. On the dot at the left, draw all of the forces acting on the bucket.

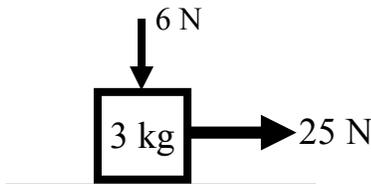
B. What is the total mass of Jim and the bucket?

C. What is the total weight of Jim and the bucket?

D. Calculate the tension in the rope when he begins to accelerate downward at -1.5 m/s^2 .



$\mu_s = 0.22$
 $\mu_k = 0.16$



From the "Surface Friction" notes:

3. A. What is the weight of the 3 kg mass?

B. What is the normal force pushing up on the mass?

C. Calculate the forces of static and kinetic friction acting on the mass.

D. If the object starts at rest, is the 25N force enough to start it moving?

E. If it is moving, calculate the acceleration of the object.

4. A 2 kg box slides to a stop in 0.65 seconds.

A. Use a kinematic equation to calculate the acceleration of the object.

B. Calculate the force of friction that stopped the object.

C. Since it was sliding, was this kinetic or static friction?

D. What is the normal force acting on the object?

E. Calculate the coefficient of friction of the surface.

