

Simple Newtonian Mechanics Review

1. If a snow skier is towed across a field by a force of 50.0 N via a horizontal rope and the kinetic friction force is 15.0 N, find the acceleration of the 72 kg skier. (Include a FBD.)
2. Greg pushes a box of food horizontally with a force of 88 N. What static frictional force is necessary to keep the box from moving? (Include a FBD.)
3. An honeycrisp apple is falling and experiences a drag force of 1.2 N. If the mass of the apple is 0.36 kg, what is the apple's acceleration?

A few moments later, the apple reaches terminal velocity. What is the drag force acting on the apple now?

Ans: #4 8.0×10^2 N & 610 N, #5 0.20 m/s^2

4. A wooden pallet with all its goods piled on top has a mass of 125 kg. If the coefficient of static friction between the pallet and the floor is 0.65 and the coefficient of kinetic friction is 0.50, find the minimum force necessary to start the pallet moving and the force needed to keep the pallet moving at constant velocity.

5. Beth pulls (horizontally with a rope) a crate filled with delicious junk food. If she pulls with a force of 350 N, the crate's mass is 85 kg, and the coefficient of kinetic friction between the crate and the floor is 0.40, calculate the crate's acceleration.

Ans: #1 0.49 m/s² #2 88 N #3 6.5 m/s² & 3.5 N