

Friction Worksheet

Monday, June 27, 2011
10:24 AM

Physics 11

Friction Problems

1. A sled is being pulled to the right with a force of 28 N. A frictional force is working opposite the applied force with a magnitude of 17 N. The mass of the sled is 4.5 kg.
 - (a) What is the net force in the horizontal direction? (11 N)
 - (b) What is the coefficient of friction between the sled's blades and the surface? (0.39)
2. A football player with a mass of 86 kg, dives into the end zone and is slowed by the grass after he hits the ground by a force of friction of 580 N. What is μ between the player and the grass? (0.69)
3. A person pushes horizontally with a force of 350 N on a 68 kg chair to move it across a level floor. The coefficient of friction is 0.37.
 - (a) What is the magnitude of the frictional force? (247 N)
 - (b) What is the acceleration of the chair? (1.52 m/s^2)
4. A force of 120 N is needed to push a box along a road at a steady speed. If the force of gravity on the box is 250 N, what is the coefficient of kinetic friction between the box and the road? (0.48)
5. The coefficient of kinetic friction between a steel block and an ice rink surface is 0.0100. If a force of 24.5 N keeps the steel block moving at steady speed, what is the force of gravity on the block? (2450 N)
6. A boy exerts a 36.0 N horizontal force as he pulls a 52.0 N sled across a cement sidewalk at constant speed. What is the coefficient of kinetic friction between the sidewalk and the metal sled runners? Ignore air resistance. (0.69)
7. Suppose the sled from question 6 now runs on packed snow. The coefficient of friction is now only 0.12. If a person weighing 650.0 N sits on the sled, what force is needed to pull the sled across the snow at constant speed? (84 N)
8. How much force does it take to pull a 100.0 kg packing crate along a rough floor, given each of the following coefficient of friction?
 - a. 0.10 (98 N)
 - b. 0.20 (196 N)
 - c. 0.50 (490 N)
 - d. 0.9 (882 N)