Friction

Part 3

1. A trunk weighing 204kg is moved across the floor of a room at a constant speed with a horizontal force of 1.00×10^2 N. What is the coefficient of kinetic friction between the trunk and the floor?

[μ_k = 0.0500]

Example 2

A 63 kilogram sprinter accelerates toward a strong wind that exerts an average frictional resistance of magnitude 63N. If the ground applies a forward force of 240 N on the sprinters body. Calculate:

a. The net force of the sprinter. $[\overrightarrow{F}_{net} = 180N \text{ [fwd]}]$

b. The sprinters acceleration. $[\overrightarrow{a} = 2.9m/s^2]$

c. The coefficient of friction between the sprinter's shoes and the track. Explain whether this friction is static or kinetic.$[\mu_s=0.39]$

Example 3

The coefficient of sliding friction between rubber tires and wet pavement is 0.50. The brakes are applied to 750kg car and the car skids to a stop.

a. What is the size and direction of the force of friction that the road exerts on the car?
[$\vec{F_k}$ = 3700N [bwd]]

b. What would be the size and direction of the acceleration of the car? Why would it be constant? [$\vec{a}$ = 4.9m/s² [bwd]]

Extension Problem

c. If the car was going 30m/s (2 sig digs), how far would the car travel before stopping?

Determining Coefficient of Friction Worksheet #2