

Name: _____

Date: _____

Section C D F

Forces IV

1. An 8 kg block is in equilibrium on an incline of angle $\theta = 20^\circ$. Draw a diagram, label forces, give $F_{\text{net},x}$ and $F_{\text{net},y}$, and find F_n of the incline on the block.

$$F_{\text{net},x} =$$

$$F_{\text{net},y} =$$

$$F_n =$$

2. A box slides down a 36.5° ramp with an acceleration of 1.41 m/s^2 . Determine the coefficient of kinetic friction between the box and the ramp.

3. A car is traveling at 50.1 km/h on a flat highway.

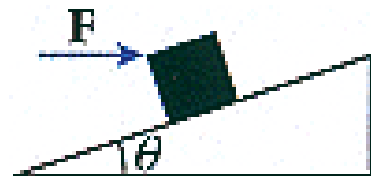
- a. If the coefficient of friction between the road and the tires on a rainy day is 0.100, what is the minimum distance needed for the car to stop?

- b. What is the stopping distance when the surface is dry and the coefficient of friction is 0.600?

4. A box of books weighing 299 N is shoved across the floor by a force of 430 N exerted downward at an angle of 35° below the horizontal.
- If μ_k between the box and the floor is 0.57, how long does it take to move the box 9 m, starting from rest? (If the box will not move, the correct answer would be 0.)
 - If μ_k between the box and the floor is 0.75, how long does it take to move the box 5 m, starting from rest? (If the box will not move, the correct answer would be 0.)

5. A block with a mass of 14 kg is held in equilibrium on an incline of angle $\theta = 30.0^\circ$ by the horizontal force, $\mathbf{F}$, as shown in the figure below. (Disregard friction)

- Find the magnitude of $\mathbf{F}$.



- Find the normal force exerted by the incline on the block.