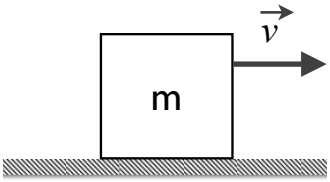
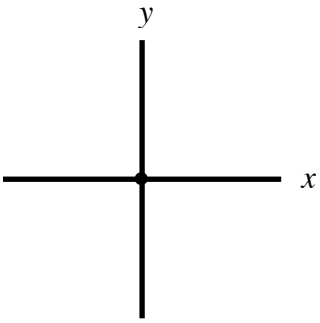
Friction

Concept: Friction is a force exerted by surfaces when they slide (kinetic friction f_k) or tend to slide (static friction f_s) over one another. Friction between sliding solids depends on the type of surfaces (via the coefficient of friction $\boldsymbol{\mu}$) and the magnitude of the normal force n.

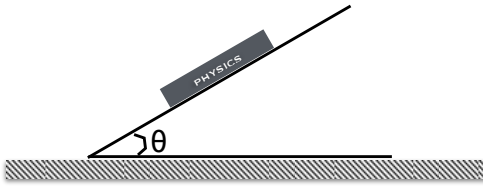
$$f_k = \boldsymbol{\mu}_k n \qquad\qquad f_s \leq f_{s\,max} = \boldsymbol{\mu}_s n$$

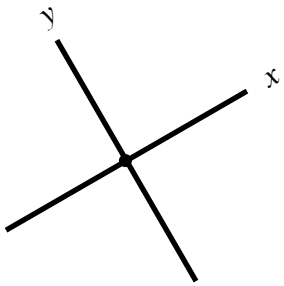
Problem 1: A student pushes a 50 kg wood box across a wood floor. It accelerates at a constant rate of 1.0 m/s^2. The coefficient of friction between the surfaces is 0.2. How much force does the student exert on the box?





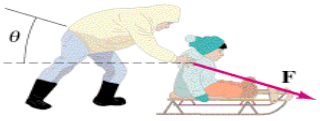
Problem 2: A student tilts her desk to make her physics book slide to the floor. The book is about to start sliding at an angle θ. Determine the coefficient of static friction μ_s between the book and the desk.



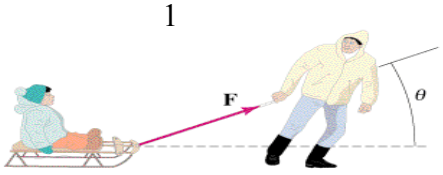


Going Sledding: Your little sister wants you to give her a ride on her sled. On level ground, what is the easiest way to accomplish this, for the case where there's friction between the sled and the ground?

a. pushing her from behind
b. pulling her from the front
c. both are equivalent
d. it is impossible to move the sled



1



2