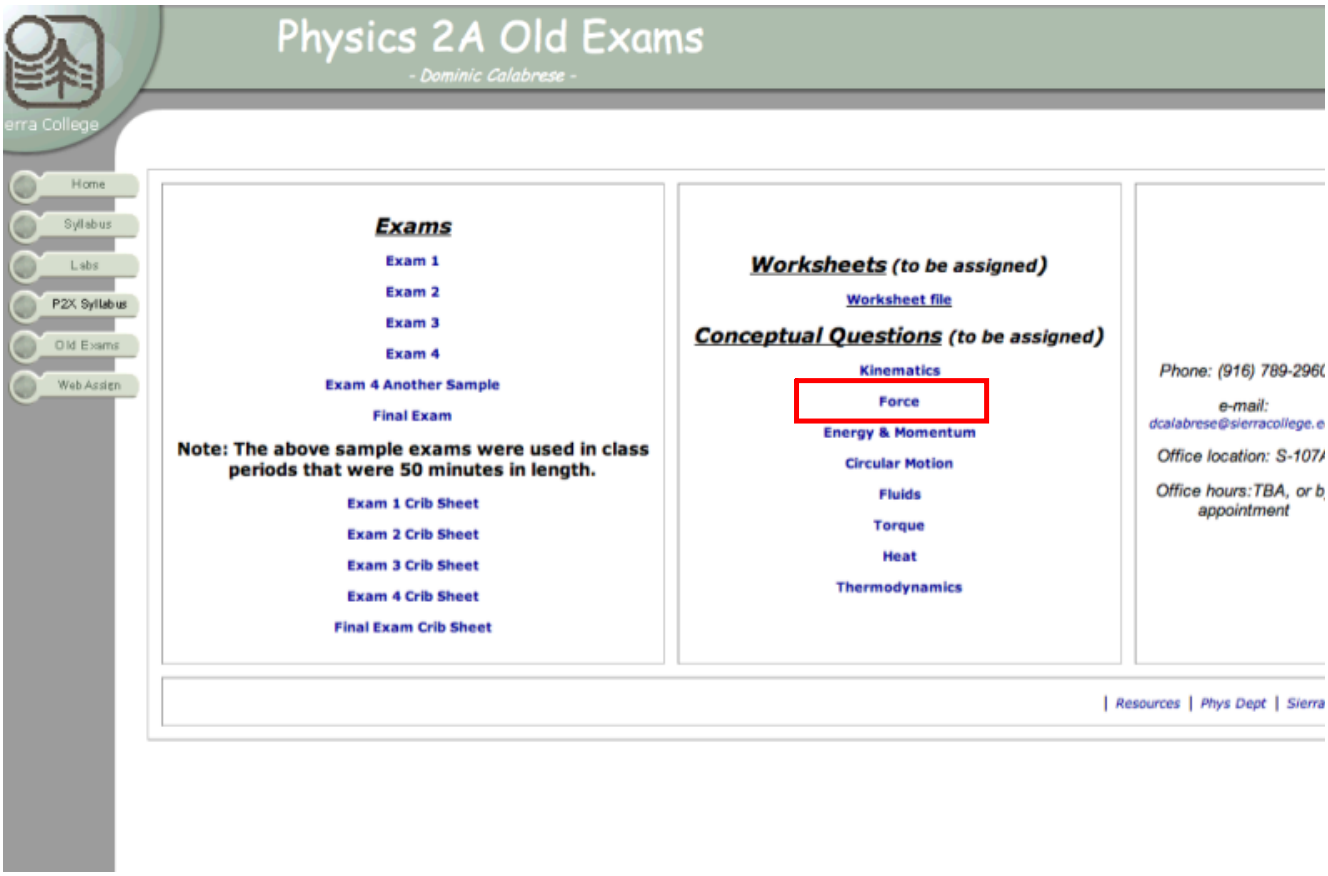
Reminders 10-01-07:
-Next Homework Due 10/4!!!
-Newton's Laws Worksheet due Today.
-Force Conceptual Questions Due Wed. 10/3.
-Conceptual Quiz Monday, Newton's Laws.

Objectives:
-Friction
-Work and Energy


Physics 2A Old Exams
- Dominic Calabrese -
erra College
Home
Syllabus
Labs
P2X Syllabus
Old Exams
Web Assign
Exams
Exam 1
Exam 2
Exam 3
Exam 4
Exam 4 Another Sample
Final Exam
Note: The above sample exams were used in class periods that were 50 minutes in length.
Exam 1 Crib Sheet
Exam 2 Crib Sheet
Exam 3 Crib Sheet
Exam 4 Crib Sheet
Final Exam Crib Sheet
Worksheets (to be assigned)
Worksheet file
Conceptual Questions (to be assigned)
Kinematics
Force
Energy & Momentum
Circular Motion
Fluids
Torque
Heat
Thermodynamics
Phone: (916) 789-296
e-mail:
dcalabrese@sierracollege.e
Office location: S-107
Office hours:TBA, or b
appointment
| Resources | Phys Dept | Sierra

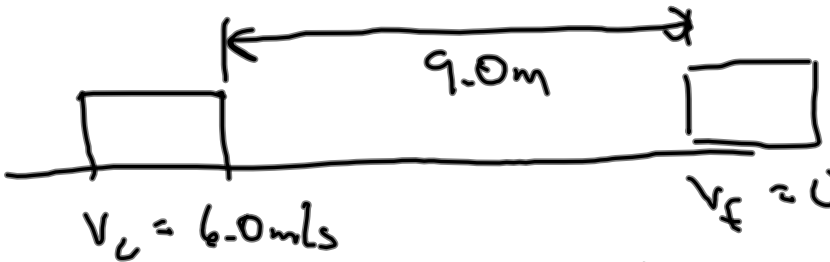
- A 2.0 kg block is given a push such that its initial velocity 6.0 m/s. It comes to a stop after traveling 9.0 m.
  - What is the object's acceleration?
  - What is the frictional force acting on block?
  - What is the coefficient of sliding friction?

$v_f^2 - v_i^2 = 2a\Delta x$

$a = \frac{v_f^2 - v_i^2}{2\Delta x}$

$= \frac{0 - \left(6.0 \frac{m}{s}\right)^2}{2(9.0m)}$

$= -2.0 \frac{m}{s^2}$



$F_f = ma = (2.0kg)\left(-2.0 \frac{m}{s^2}\right) = \underline{-4.0N}$

$f_f = -\mu_K N = -4.0N$

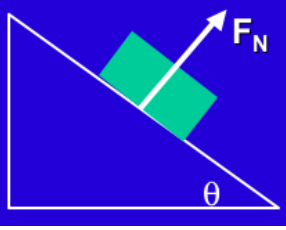
$\mu_k = \frac{4.0N}{N} = \frac{4.0N}{(2.0kg)(9.80 \frac{m}{s^2})}$

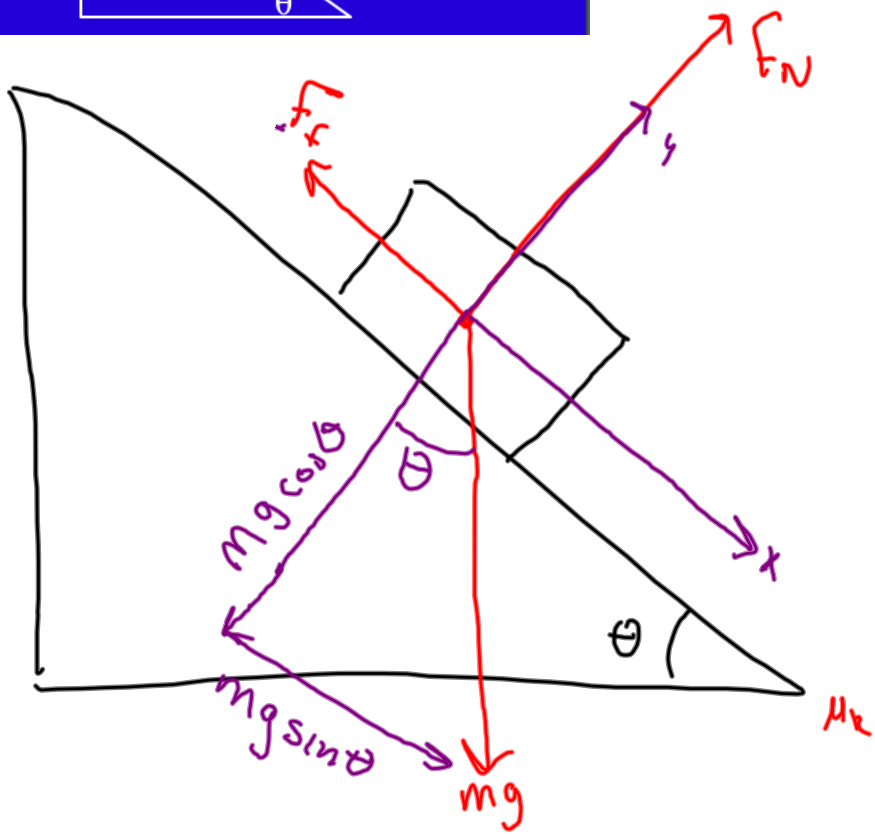
$= .2$

$\mu mg = ma$

$\boxed{a = \mu g}$

- A block slides down a wedge with coefficient of kinetic friction μ_k? What is its acceleration?What if it is moving upward?





$$\sum F_x = -f_r + mg\sin\theta = ma$$

$$\sum F_y = f_N - mg\cos\theta = 0$$

$$\sum F_x = -\mu_k f_N + mg\sin\theta = ma$$

$$f_N = mg\cos\theta$$

$$= -\mu_k mg\cos\theta + mg\sin\theta = ma$$

$$a = g\sin\theta - \mu_k g\cos\theta$$

Sep 18-2:46 PM

$$a = -\mu g \cos\theta + g \sin\theta$$

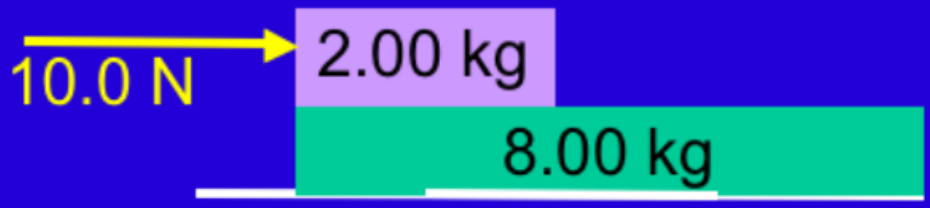
How do we find μ_s

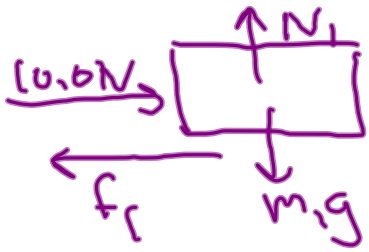
$$0 = -\mu_s g \cos\theta + g \sin\theta$$

$$\mu_s \cos\theta = \sin\theta$$

$$\mu_s = \tan\theta$$

- A 2.0 kg block rests on the left edge of a 8.00 kg block. The value μ_k is 0.30 between the blocks. There is no friction between the table and the bottom block. What is the acceleration of the larger block? What about the top block?





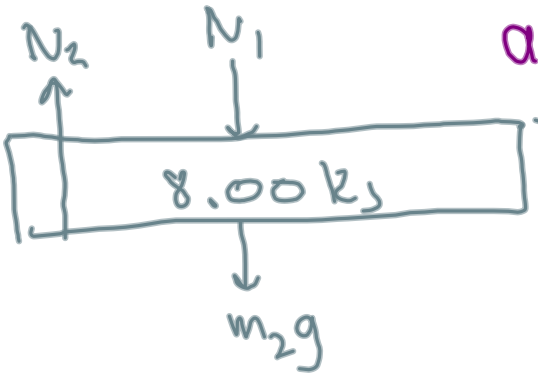
$10.0N - f_f = ma$

$10.0N - \mu mg = ma$

$a = \frac{10.0N - \mu mg}{m}$

$= \frac{10.0N - (.3)(2.0)(9.80)}{2.0}$

$a = 2.06\ m/s^2$



$f_f = m_2a$

$\mu m_1 g = m_2 a$

$a = \frac{\mu m_1}{m_2} g$

$= (.3)\left(\frac{2}{8}\right)(9.8) = .74\frac{m}{s^2}$

Limitations of Newton's Laws

Newton's 2nd law $\Sigma \vec{F} = m\vec{a}$ only valid in frames that are moving at constant velocity