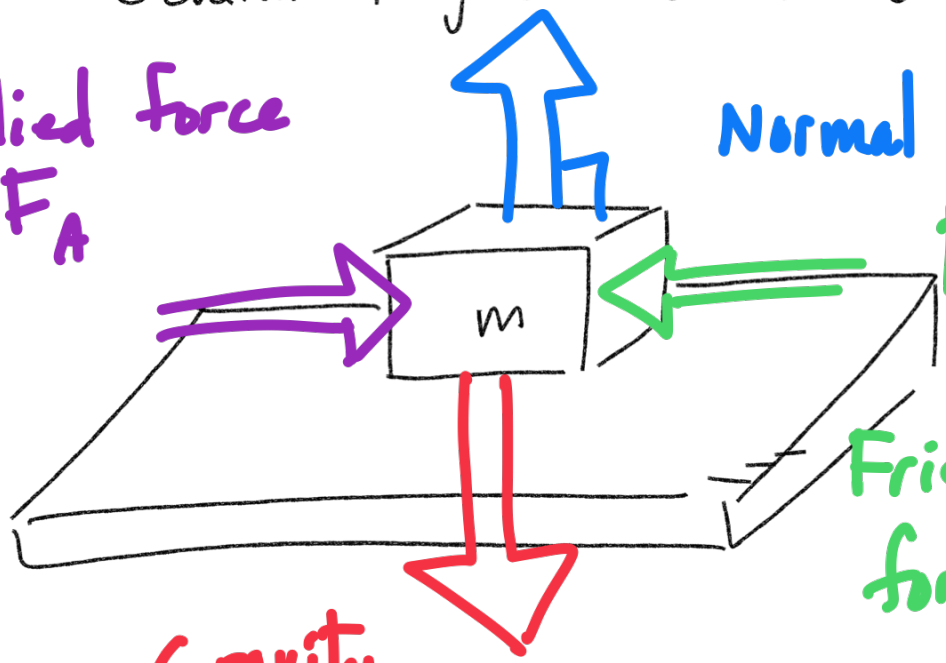
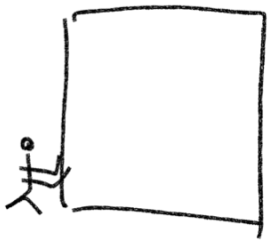
M-GP General Physics Week 26 4/15



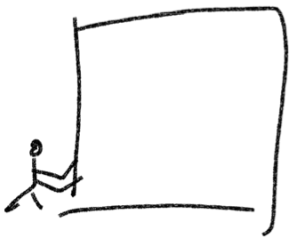
$F_A > F_f$ moves

$F_A < f_f$ No movement



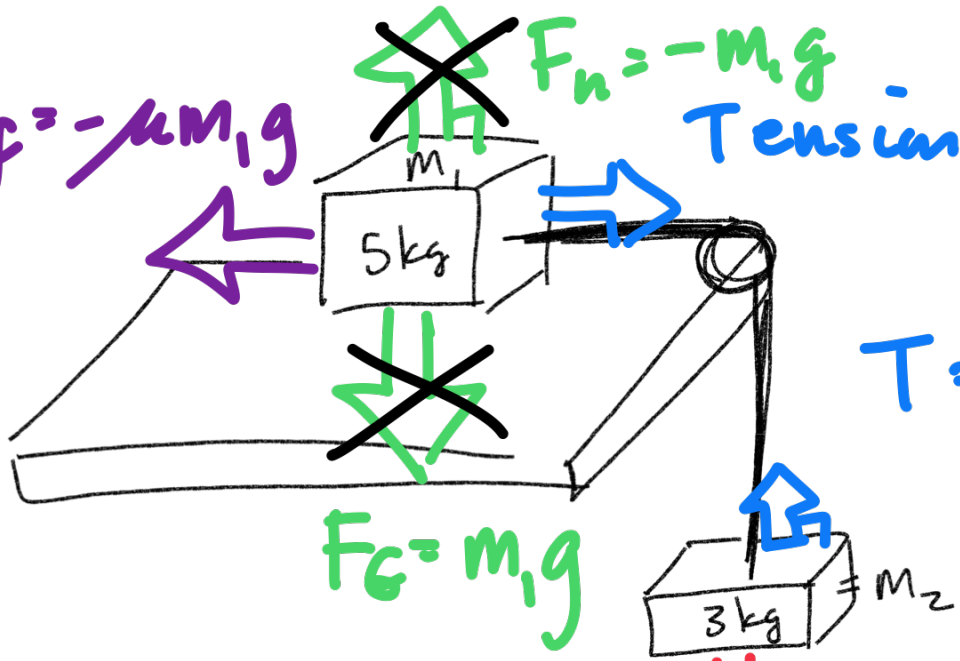
Static friction

Force to overcome an object at rest

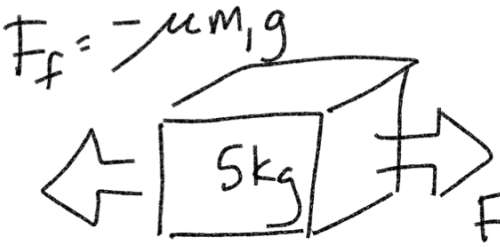


Dynamic/kinetic friction

Force to overcome the friction of a moving object.



$\mu = 0.400$



$g \approx -10\ m/s^2$

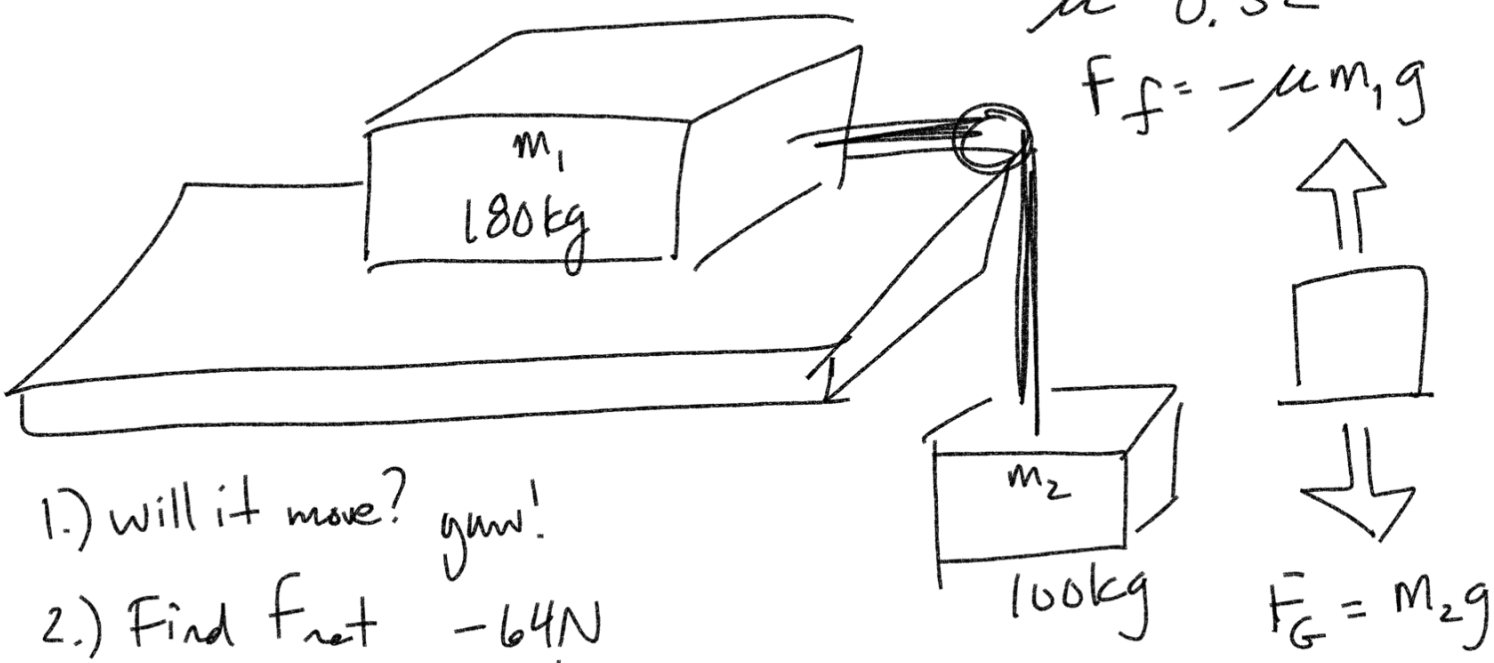
$$F_{net} = m_2 g + (-\mu m_1 g)$$

$$(3kg)(-10\ m/s^2) + (-)(0.400)(5kg)(-10\ m/s^2)$$

$$-30N + 20N = \boxed{-10N} = F_{net}$$

A = ?

$$F = ma \qquad a = \frac{F}{m} = \frac{-10N}{5kg + 3kg} = \frac{-10N}{8kg} = \boxed{-1.25\ m/s^2}$$



1.) will it move? gww!

2.) Find F_{net} $-64N$

3.) If it moves, acceleration?

$$F_{net} = -\mu m_1 g + m_2 g$$

$$(-0.52)(180kg)(-10 m/s^2) + (100kg)(-10 m/s^2)$$

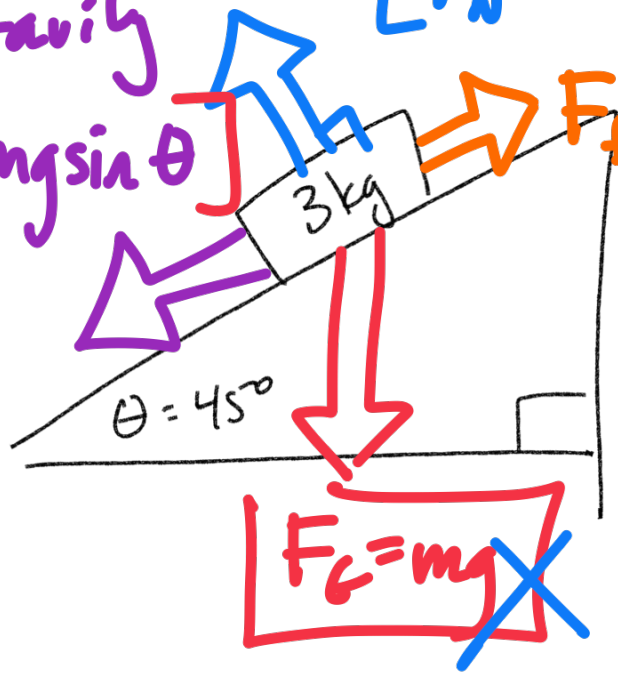
$$936N + (-1000N) = -64N$$

$$a = \frac{F_{net}}{\text{total mass}} = \frac{-64N}{180kg + 100kg} = \boxed{-0.29 m/s^2}$$

comes from gravity

$[F_N = \cancel{X} mg\cos\theta]$

$[F_m = mg\sin\theta]$



$\mu = 0.200$

$$F_{net} = F_m + F_f$$

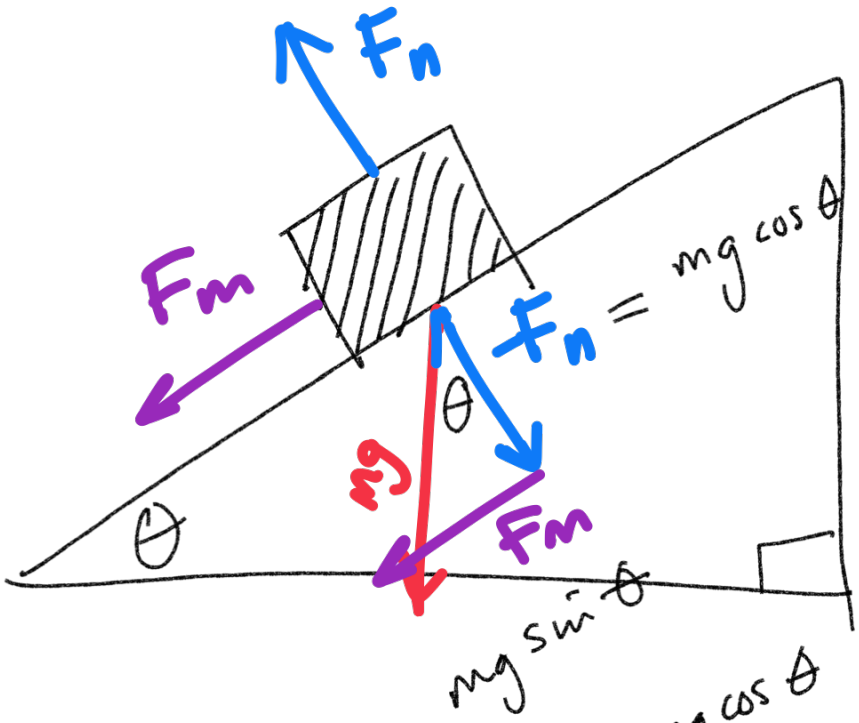
$$mg\sin\theta + (-\mu mg\cos\theta)$$

$$(3kg)(-10\,m/s^2)(\sin 45^\circ) + (-0.200)(3kg)(-10\,m/s^2)\cos 45^\circ$$

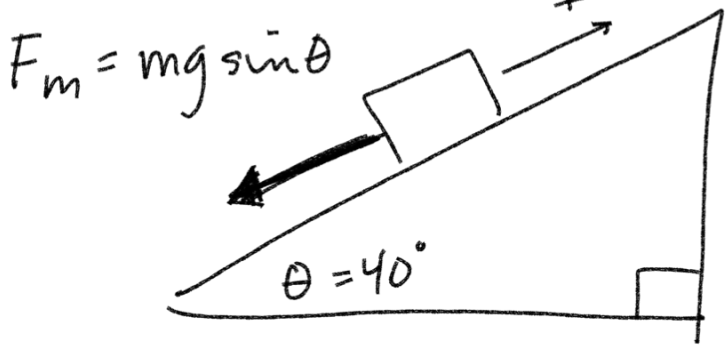
$-21.2\,N$ $\qquad$ $4.24\,N$

$$= \approx -17N$$

$$a = \frac{F}{m} = \frac{-17N}{3kg} = \boxed{-5.7\,m/s^2}$$



$F_f = -\mu mg\cos\theta$



$m = 18.0\ kg$

$\mu = 0.300$

a) Does it move?

b) F_{net}?

c) acceleration?

$F_{net} = F_m + F_f$

$mg\sin\theta + (-\mu mg\cos\theta)$

$(18\ kg)(-10\ m/s^2)(\sin 40) + (-0.300)(18\ kg)(-10\ m/s^2)(\cos 40)$

$-115.7\ N + 41.37\ N = \boxed{-74.3\ N}$

$a = \frac{F_{net}}{m} = \frac{-74.3\ N}{18\ kg} = \boxed{-4.1\ m/s^2}$