Two Common Forces - Weight and Friction

Weight - the force of gravity acting on an object (N)

- depends on location (g ~ the acceleration of gravity ~ is $9.81 m/s^2$ near the Earth's Surface)

$$\vec{F}_g = m\vec{g}$$

Friction -> static + kinetic

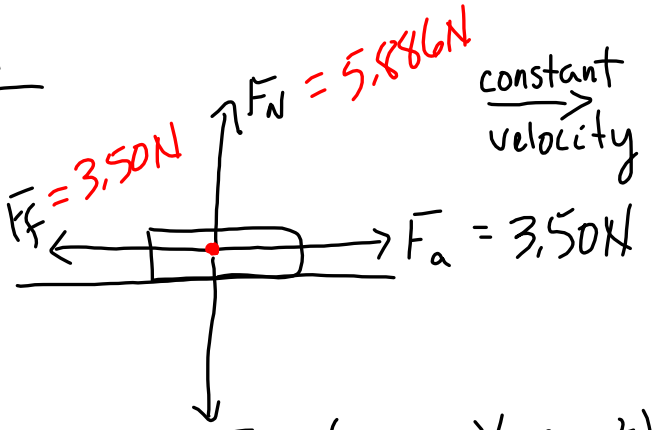
-> depends on the surfaces and the object's mass (really the normal force on the object)

-> draw a FBD

$$F_f = \mu F_N$$

PP 14.4

5. b)



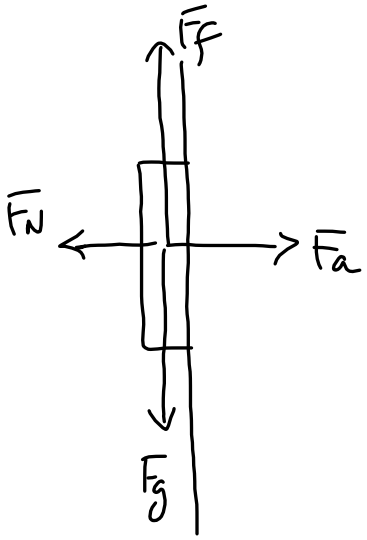
$F_g = (0.600kg)(9.81m/s^2)$

$F_g = 5.886\ N$

$F_f = \mu F_N$

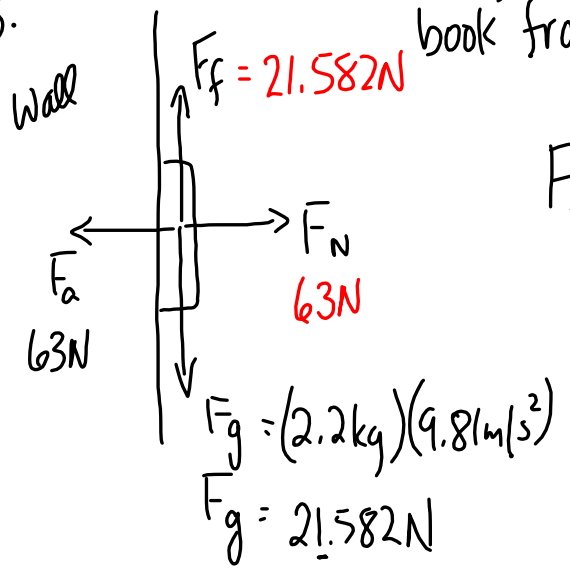
$\mu = \frac{F_f}{F_N}$

$\mu = \frac{3.50N}{5.886\ N}$



PP|144

8.



If you push just hard enough to stop the book from slipping then:

$F_f = F_g$

We also know that $F_a = F_N$ (no motion horizontally)

$F_f = \mu F_N$

$\mu = \frac{F_f}{F_N}$

$\mu = \frac{21.582N}{63N}$

$\mu = 0.34$

The coefficient of static friction is 0.34

Chapter 5 ~ Newton's Laws

Thought Experiments (p153)

	A	B	C	D
1	0	0	14	6
2	0	0	8	12
3	8	3	3	6

Newton's First Law (Law of Inertia)

An object at rest or in uniform motion will remain at rest or in uniform motion unless acted upon by an external force.

Assignment p151/26-35 (due Thurs)

HINTS:

29. Consider a 1 kg mass on Earth and then on Mars. Take the weight on Earth as the "true" value.

32. See PP/144/8

35. Draw FBDs for each situation. Make sure your vectors reflect the relative size of the forces.