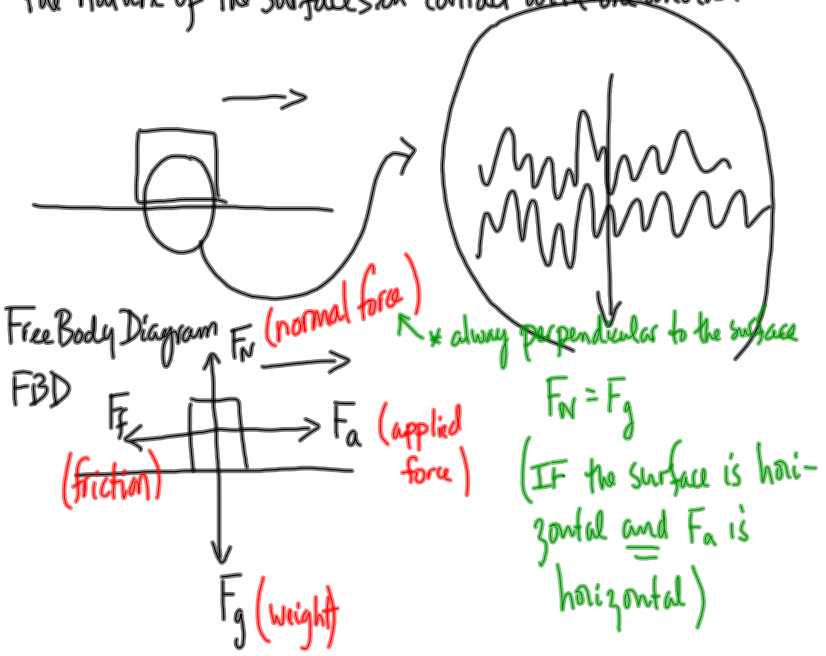
Friction

- friction is a type of force. There are two types:

① Static friction - the frictional force that needs to be overcome in order to just start an object moving. (Gradually increases to a max value)

② Kinetic friction is the frictional force acting on moving object (constant value)

Friction depends on the object's mass and the nature of the surfaces in contact with ~~one another~~.



* always perpendicular to the surface

$F_N = F_g$

(IF the surface is horizontal and F_a is horizontal)

$$F_f \propto F_N$$

$$F_f = \mu F_N$$

where F_f is the frictional force (N)

F_N is the normal force (N)

μ is the coefficient of friction (depends on the surfaces)

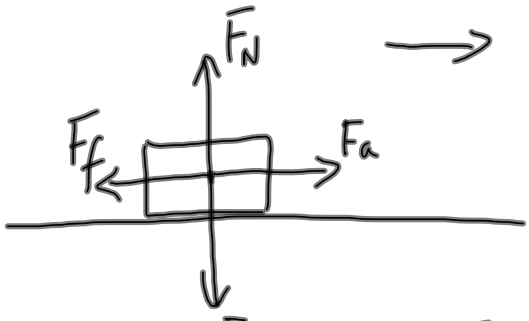
Traffic Accident Investigators must find the coefficient of friction in order to estimate the speed a car was travelling before skidding.

MP/141

$M = 2.00 \times 10^2 \text{ kg}$

$\mu_s = 0.70$ (rubber on wet concrete)

F_f (static) = ??



$F_g = mg$

$F_f = \mu F_N$

$F_f = \mu F_g$

$F_f = \mu mg$

$F_f = (0.70)(2.00 \times 10^2 \text{ kg})(9.81 \text{ m/s}^2)$

$F_f = 1.4 \times 10^3 \text{ N}$

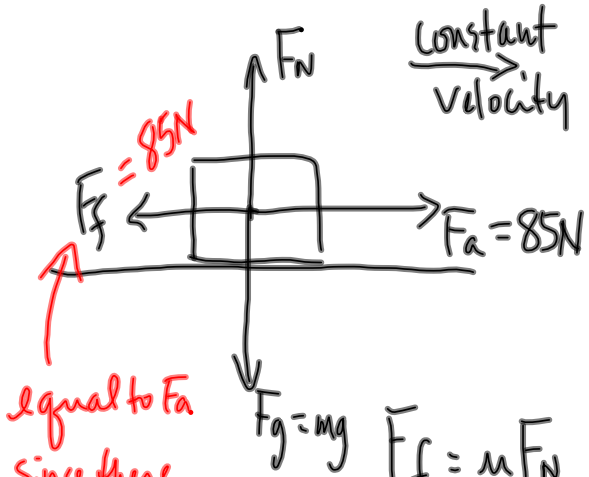
MP|143

$F_a = 85N$

$m = 52kg$

$\mu = ?$

constant velocity



$F_f = \mu F_N$

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

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

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

$\mu = \frac{85N}{(52kg)(9.81 m/s^2)}$ $\frac{N}{N} = 1$

N

$\mu = 0.17$

TO DO

- PP|144
- Assignment

P151|26-35
(due Fri, Dec 14)