Weight + Friction

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

PP 137

$m = 1.00\,kg$

$\vec{F}_g = 3.25\times10^{-2}\,N\,[down]$

$\vec{g} = ??$

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

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

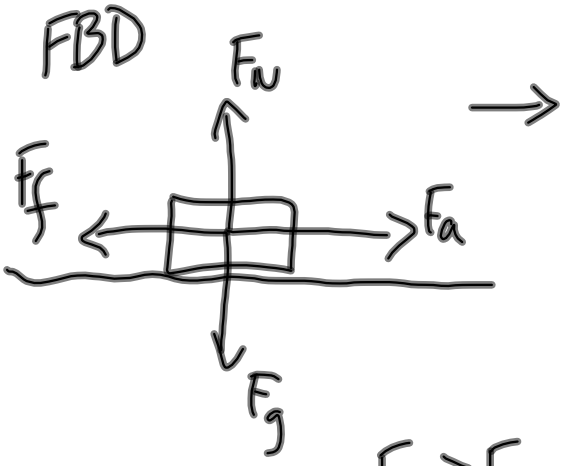
$$\vec{g} = \frac{3.25\times10^{-2}\,N\,[down]}{1.00\,kg}$$

$$\vec{g} = 3.25\times10^{-2}\,m/s^2\,[down]$$

Friction

$F_f = \mu F_N$

FBD



$F_a > F_f$ + acc

$F_a < F_f$ − acc

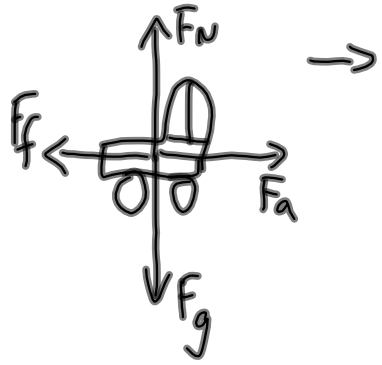
$F_a = F_f$ no acc (constant v)

MP 141

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

rubber + wet concrete: $\mu_s = 0.70$

$F_f(\text{static}) = ?$



$F_f = \mu F_N$

$F_f = \mu F_g$

$F_f = \mu mg$

$F_f = (0.70)(200 \text{ kg})\left(9.81 \text{ m/s}^2\right)$

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

You have increased the force of Static friction by $1.4 \times 10^3 \text{ N}$

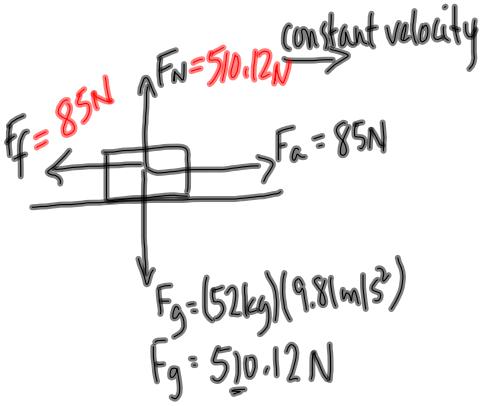
MP|143

$F_a = 85N$

$m = 52kg$

$\mu_k = ?$

$a = 0$ (constant velocity)



Since the sled is travelling at a constant velocity, $F_a = F_f$

Since there is no motion vertically, $F_N = F_g$

$F_f = \mu F_N$

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

$\mu = \frac{85N}{510.12N}$

$\mu \doteq 0.17$

TO DO:

① PP|144

② Assignment: p151|26-35 (due Tues Nov 1)

HINT: #35 .... draw FBD's that show + acc, no acc, - acc

* be sure to draw vectors to represent the size of the force

#29 Think of a 1.00kg mass on earth + then somplace else!