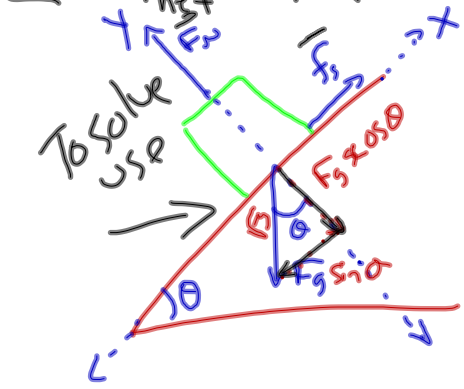
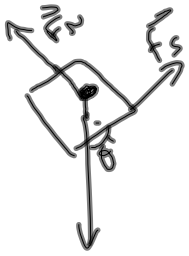
Newton's Laws & FBD's

Forces, Acceleration, Mass, Inertia

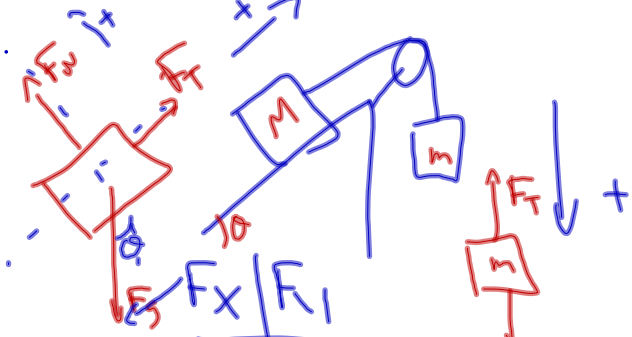
$\sum \vec{F} = \vec{F}_{net} = m\vec{a}$





FBD

Be careful of directions.



F_x	F_y
F_T	F_N
$-F_g \sin\theta$	$-F_g \cos\theta$
$M_g M_a$	0

$F_N - F_{gM}\cos\theta = 0$

$F_T - F_g \sin\theta = Ma$

$F_N = Mg\cos\theta$

$F_T - M_g \sin\theta = Ma$

F_x	F_y
F_T	
F_g	
$mg - F_T = ma$	

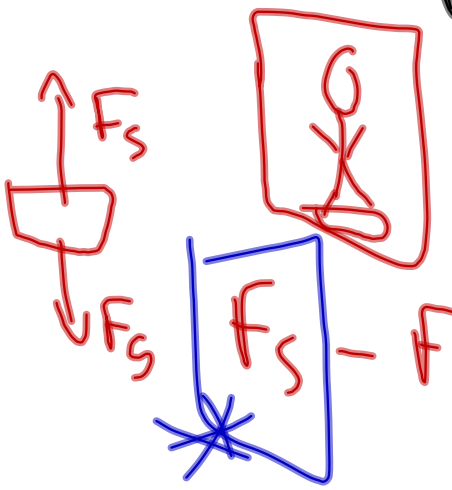
$mg - F_T = ma$

Apparent Weight

→ what a scale reads in an accelerated (vertically) reference frame.

$F_s - F_g = 0$ For no "a"

↑ F_s ← what ↑ + Scale reads



↑ $a = 3\ m/s^2$

$F_s - F_s = ma$

$F_s = ma + mg$

μ

Friction = $f = \mu F_N$

Static Kinetic

Interaction between Surfaces

μ = (oefficient of Friction
- particular between 2 surfaces
(temp. + humidity)

μ_s -> Static Coeff. μ_k = Kinetic Coeff.