Dynamics Test

Chapter 4

- weight: $\vec{F}_g = m\vec{g}$ $(\vec{g} = 9.8\ m/s^2\ [down])$
  near the earth's surface.
- friction: $F_f = \mu F_N$
  (static & kinetic) $F_N = F_g$ (if surface + F_a are horizontal)
  - Draw a FBD
    static: $F_a = F_f$ (to just start moving)
    kinetic: $F_a = F_f$ (constant velocity)

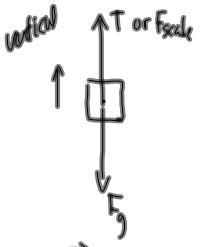
Chapter 5 - Newton's Laws

① law of Inertia

② $\vec{F}_{net} = m\vec{a}$

* DRAW A FBD

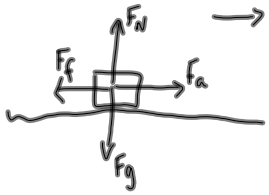
vertical



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

$T - F_g = ma$

horizontal



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

$F_a - F_f = ma$

If $F_a > F_f$, + acc

$F_a = F_f$, no acc

$F_a < F_f$, - acc

③ Action-Reaction $\vec{F}_{A\,on\,B} = -\vec{F}_{B\,on\,A}$ (apparent weight & towing problems)

Momentum & Impulse

mom: $\vec{p} = m\vec{v}$ $\quad \vec{J} = \Delta\vec{p}$

imp: $\vec{J} = \vec{F}\Delta t$ $\quad \vec{F}\Delta t = m\Delta\vec{v}$

Impulse - Momentum Theorem.

maybe useful

$\Delta d = v_1\Delta t + \frac{1}{2}a(\Delta t)^2$	$\Delta d = v_2\Delta t - \frac{1}{2}a(\Delta t)^2$	$v_2^2 = v_1^2 + 2a\Delta d$
$F_g = mg$ weight	$F_f = \mu F_N$ friction	$F_{net} = ma$ Newton's 2nd Law
$p = mv$	$J = F\Delta t$	$F\Delta t = m\Delta v = \Delta p$
momentum	Impulse	imp-mom theorem.