Kinematic Equations

$x = x_0 + \overline{v}t$

$v = v_0 + at$

$x = x_0 + v_0t + \frac{1}{2}at^2$

$v^2 = v_0^2 + 2a(x - x_0)$

Force:

Fnet = ma

Units: Newtons (N)

Weight

$\overline{w}$ = mg

g = 9.8 m/s^2

Tension

T = $\overline{w}$ = mg

Friction

$f = F_f = \mu_k N = \mu_k mg$

Centripetal Force:

$F_c = m \cdot a_c = m\frac{v^2}{r}$

$= m \cdot r \cdot \omega^2$

$F_c = F_{net}$

$F_{net} = N + mg$

Torque

$\boldsymbol{\tau} = rF\sin\theta = r_{\perp}F$

Units: m• N

CCW=POS

CW=NEG

Momentum

$p = mv$

Cons. of Mom.

$p_1 + p_2 = p'_1 + p'_2$

Impulse

$\Delta p = F_{net} \bullet \Delta t$

Kinetic Energy

$K = \frac{1}{2}mv^2$

Unit: Joules (J)

Potential Energy

$PE_g = mgh$

Cons. of Energy

$KE_i + PE_i = KE_f + PE_f$

$\frac{1}{2}mv_i + mgh_i = \frac{1}{2}mv_f + mgh_f$

Work

$w = Fd\cos\theta$

$w_{net} = \Delta KE = -\Delta PE$

Whatever you are struggling with

Whatever you are struggling with

Steps of a Torque Problem

1. Draw a FBD
2. 2nd Law Equation
3. Torque Diagram
4. Torque equation

Draw out an in-class Example