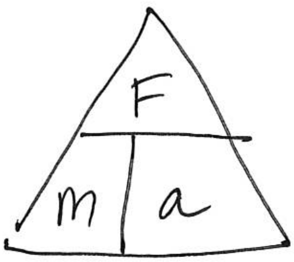
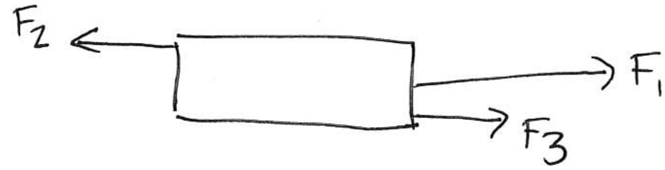
Force Equations

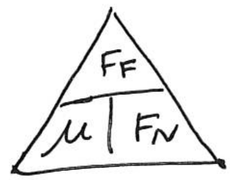
$F = m \cdot a$



$F_{net} = F_1 + {}^-F_2 + F_3 \ldots$



$F_{Friction} = \mu F_N$



Velocity & Distance Equations

$V = V_0 + a \cdot t$

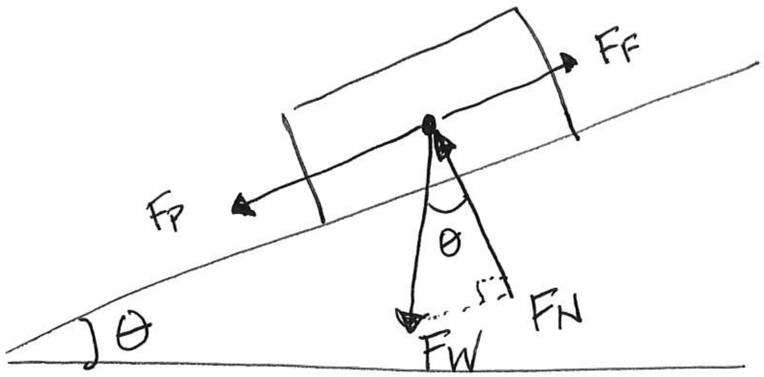
$d = d_0 + V_0 \cdot t + \frac{1}{2} a \cdot t^2$

$V^2 = V_0^2 + 2a(d - d_0)$

V_0 = initial velocity
V = final velocity
d_0 = initial distance
d = final distance
a = acceleration
t = time (sec)

Special Forces

$g = 9.81\ m/s^2$



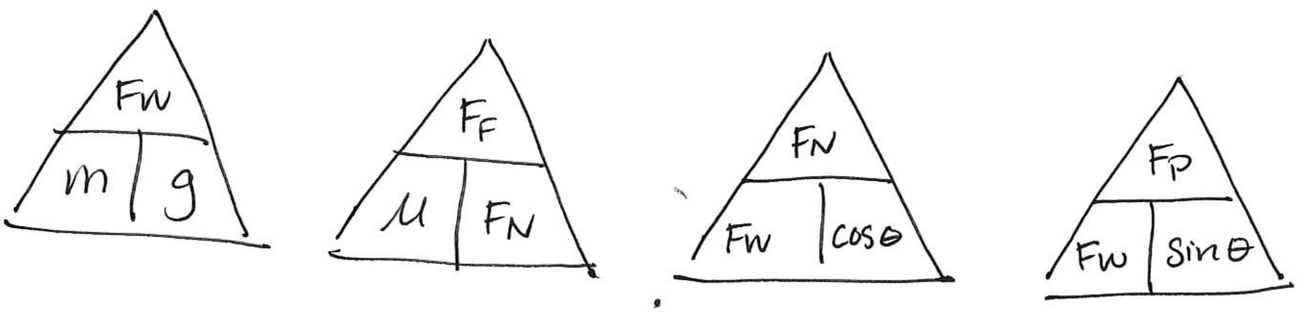
$F_W = m \cdot g$

$F_F = \mu \cdot F_N$

$F_N = F_W \cdot \cos\theta$

$F_P = F_W \cdot \sin\theta$

μ = coefficient of friction



Gravity Forces

$$F_G = -\frac{G \cdot m_1 \cdot m_2}{r^2}$$

F_G = Force Gravity

$G = 6.67 \times 10^{-11}\ \frac{N \cdot m^2}{kg^2}$

m_1 = first mass (kg)

m_2 = second mass (kg)

r = distance from center to center

Step 1: Label Δ Legs (O, A, H)

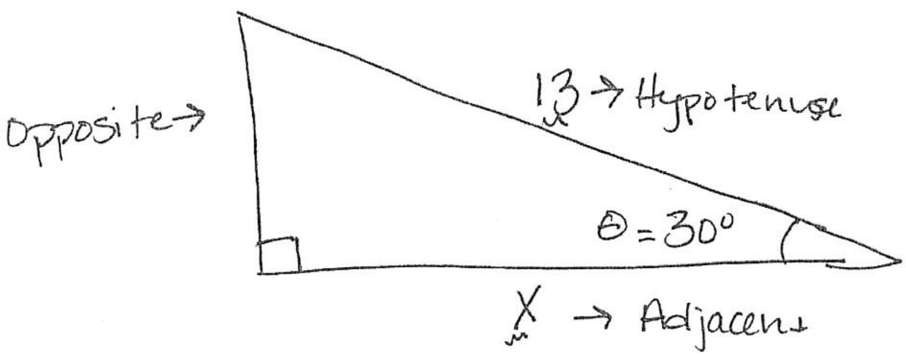
Step 2: Pick Formula

Step 3: Solve

$\sin(\theta) = \frac{O}{H}$

$\cos(\theta) = \frac{A}{H}$

$\tan(\theta) = \frac{O}{A}$



* Adjacent (A) = Is the leg of the Δ that touches θ and the right angle □.

* Opposite (O) = Is the leg of the Δ that does NOT touch θ, but it does touch the right angle □.

* Hypotenuse (H) = Is the leg of the Δ that is the longest side. No ends touch the right angle □.

#1. Have legs H, A, θ,

#2. Look for formula that has A, H $\quad \cos(\theta) = \frac{A}{H}$

#3. Solve

$$13 \cdot \cos(30°) = \frac{X}{13} \cdot 13$$

$$13 \cdot \cos(30°) = X$$