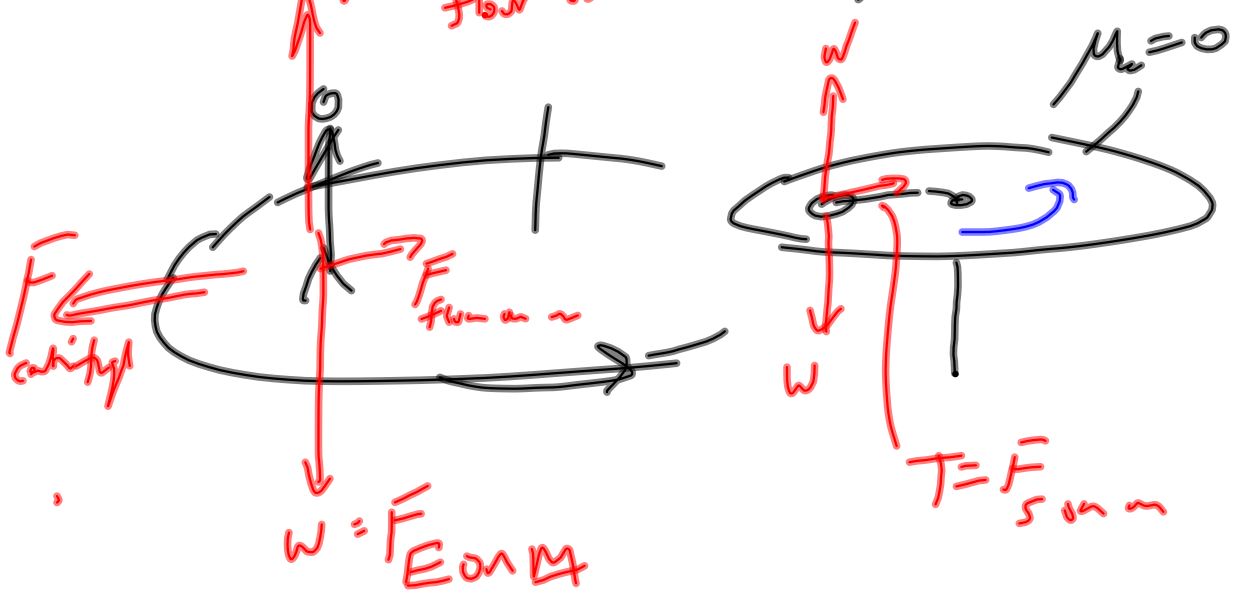
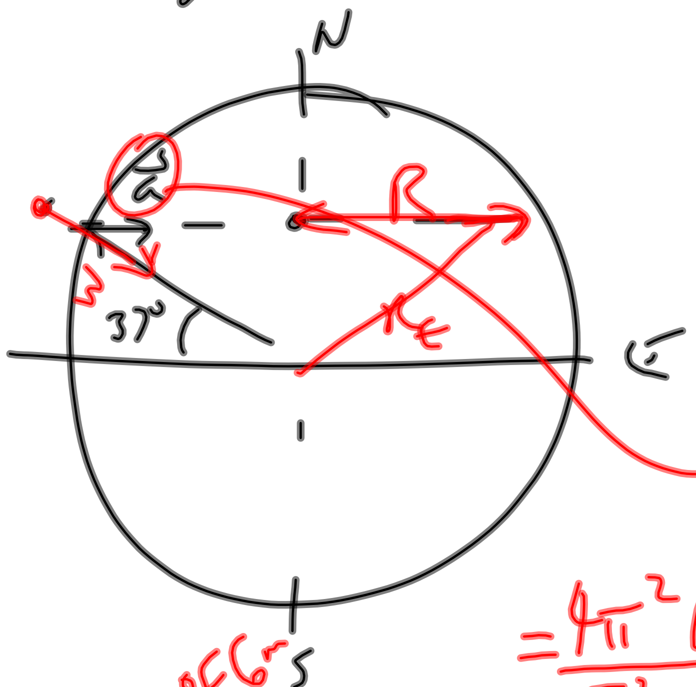
$\vec{F}_{net} = m\vec{a}$ only in an inertial ref frame!

$\vec{a} = 0$



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

only in non accel. ref. frame



$$\vec{F}_{net} = W$$

$$a = \frac{v^2}{R} = \frac{\left(\frac{2\pi R}{T}\right)^2}{R}$$

$$= \frac{4\pi^2 R}{T^2} = \frac{4\pi^2}{T^2} R_E \cos 37^\circ$$

$$= .027\ m/s^2$$

$R_E = 6.38E6\ m$

$T = 24\ hr$

Sep 29-11:12 AM

$\vec{F}_{net} = m\vec{a}$ $\quad v \ll c$

$1/\gamma = \sqrt{1-(v/c)^2}$

Mach 10 $= 10 v_s = 3400$ m/s ~ 7000 mph

$\frac{v}{c} = \frac{3400 \text{ m/s}}{3E8 \text{ m/s}} \approx 10^{-5}$ $\quad (v/c)^2 = 10^{-5}$

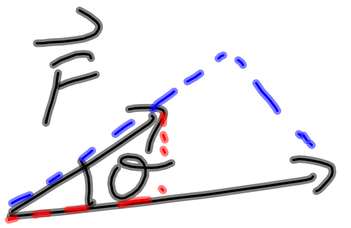
$\sqrt{1-(v/c)^2} = .99999999935 \approx 1$

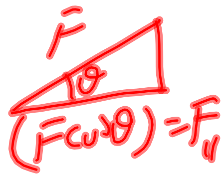
$m = \frac{m_0}{\sqrt{1-(v/c)^2}}$

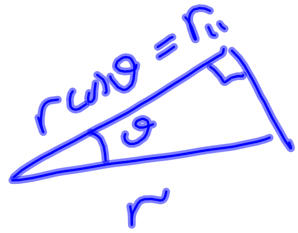
$p + p \to d + e^+ + \bar{\nu}_e$

$\nu_e \to \nu_\mu \to \nu_\tau \to \nu_e$

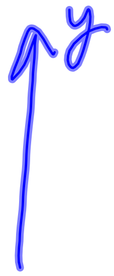
$$W = F\,\Delta r_{\parallel} = F_{\parallel}\,\Delta r$$







$$W_{mg} = -mgh$$
$$= -mg\,\Delta y$$



Climb Mtn

$\Delta y = 14200' - 6412'$ in ~~6hr~~ 7hr

$= 7800' = 2.377\text{ km} = \underline{2377\text{ m}}$

$$W = -(80\text{ kg})(10\text{ m/s}^2)(2400\text{ m})$$

$$|W| = +1.9\text{ MJ}\left(\frac{1\text{ Cal}}{4184\text{ J}}\right) = 459\text{ Cal}$$

~3 cans pop

$$P \doteq \frac{W}{\delta t} \sim \frac{1.9\,MJ}{7\,hr\left(\frac{3600\,s}{1\,hr}\right)}$$

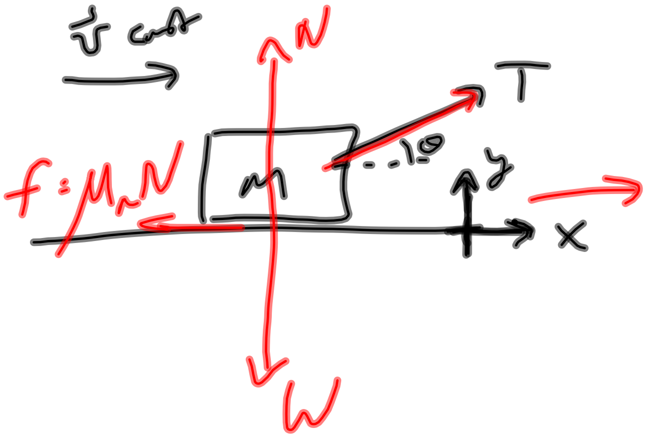
$\sim$ energy per time

$$= 76\ \frac{J}{s} = 76\ W$$

James ~~Watt~~ – W.

$$W_{RP} = (73\,kg)(9.8\,m/s^2)(3.25\,m) = 2320\,J$$

$$T_{RP} = 3.34\,s \qquad P = \frac{2320\,J}{3.34\,s} = \underline{690\,W}.$$



	x	y
$\vec{W}$	0	$-mg$
$\vec{N}$	0	$+N$
$\vec{f}$	$-\mu N$	0
$\vec{T}$	$+T\cos\theta$	$+T\sin\theta$
$\vec{F}_{net} = m\vec{a}$	$Tc - \mu N = 0$	$N - mg + Ts = 0$

$T(\theta) = \ldots$