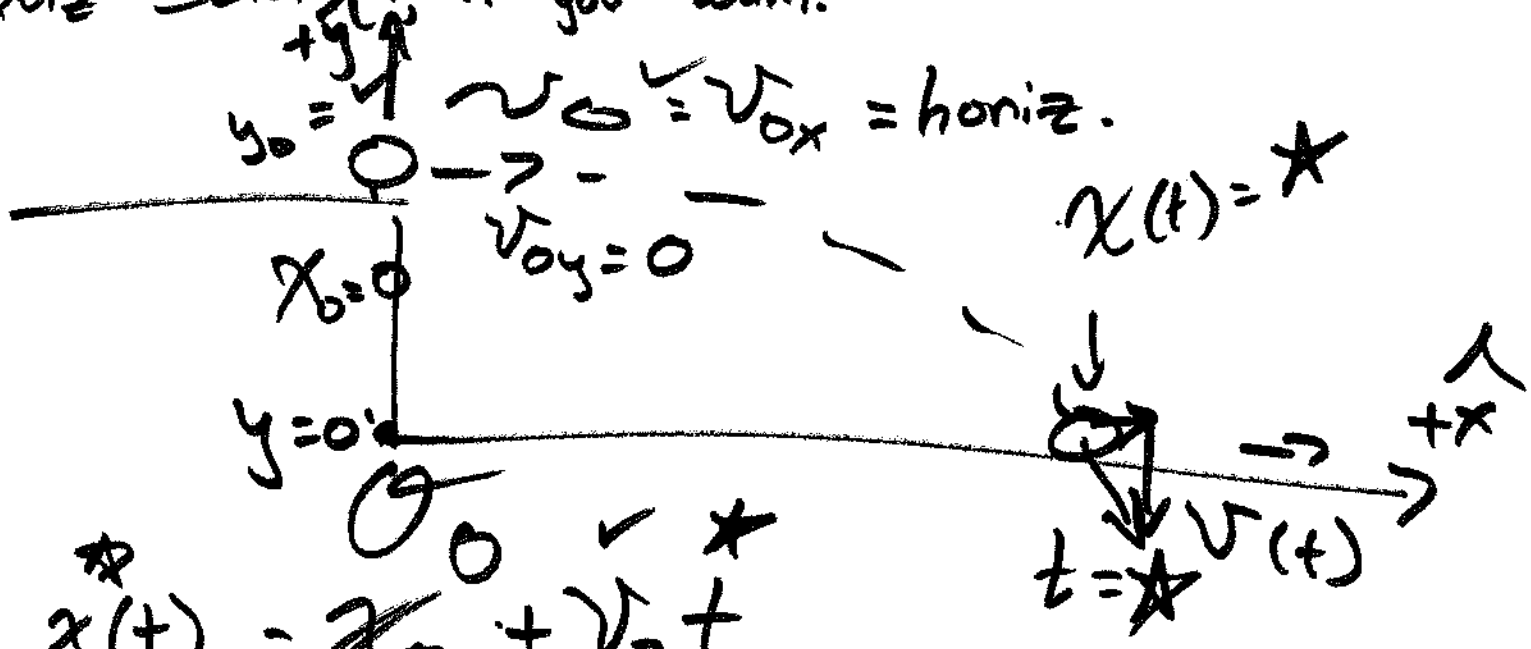
Physics 200 Day 8

Proj. motion Quiz 1.0 Name Front & Back

Then: Forces: Tension, Pulleys, etc.

Quiz Solution, if you want.



$x(t) = x_0 + v_0 t$

y: Set $y = 0$ to find t.

(II) $y(t) = y_0 + v_{0y} t + \frac{1}{2} a_y t^2$

$0 = 1.1\,m + 0 - \frac{1}{2} g t^2$

$\frac{-1.1\,m}{-4.9\,m/s^2} = t^2 \rightarrow \boxed{t = 0.474\,s}$

$x(t) = 5.5\,m/s \cdot t = \boxed{2.61\,m = x}$

Forces:

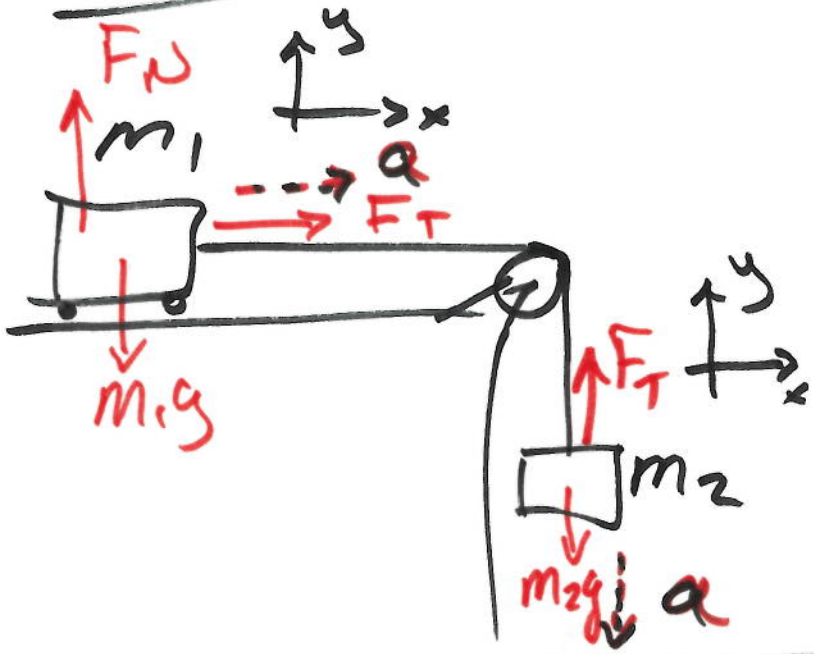
$\vec{F}_{1,2} = -\vec{F}_{2,1}$ ←

$\Sigma \vec{F} = m\vec{a}$

w/ no forces, $\vec{a} = 0$
and $\vec{v}$ = const.

10AM after 6pm.
OH on Thurs. maybe in STEM Center: El Dorado Hall

move hw 3 back: due midnight Sat/Sun



Given: m_1, m_2 g
picture
ideal string + Pulley

Want: Find a of each mass + tension in string.

F_T''

Ideal String/Rope

- massless
- $m_{string} << m_{other}$
- Force Tension is uniform
  pulls both ends toward center
  pulls straight along line

Ideal Pulley

low mass
low friction
→ Tension is uniform

①:

$\Sigma F_x = m_1 a$

$F_T = m_1 a$

$\Sigma F_y = m_1(0)$ $a_y = 0$

$F_N - m_1 g = 0$? meh ?

$\therefore F_N = m_1 g$ yay!

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②: $\Sigma F_x = m_2 a_{2x}$

$0 = 0$

$\Sigma F_y = m_2 a_{2y}$

$F_T - m_2 g = -m_2 a$

$m_1 a - m_2 g = -m_2 a$

$m_1 a + m_2 a = m_2 g$

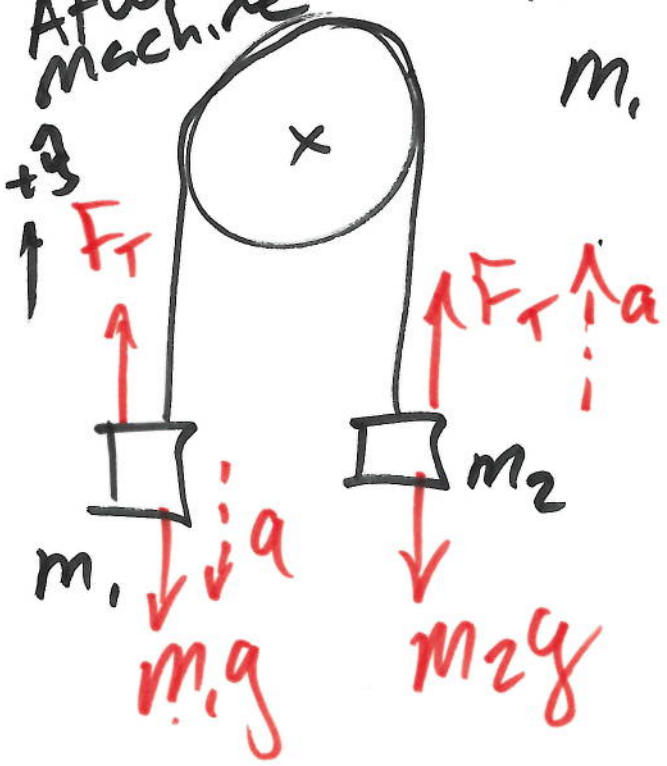
$a(m_1 + m_2) = m_2 g$

$$a = \frac{m_2 g}{m_1 + m_2}$$

$F_T = m_1 a$

$$F_T = \frac{m_1 m_2 g}{m_1 + m_2}$$

Atwood's Machine



Ideal pulley

$m_1 > m_2$ Find: F_T and a of each mass.

$F_T - m_2 g = +m_2 a$

$F_T - m_1 g = -m_1 a$