

NYU Physics I

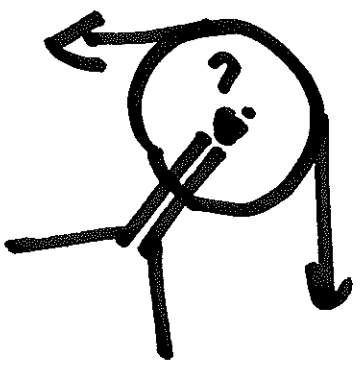
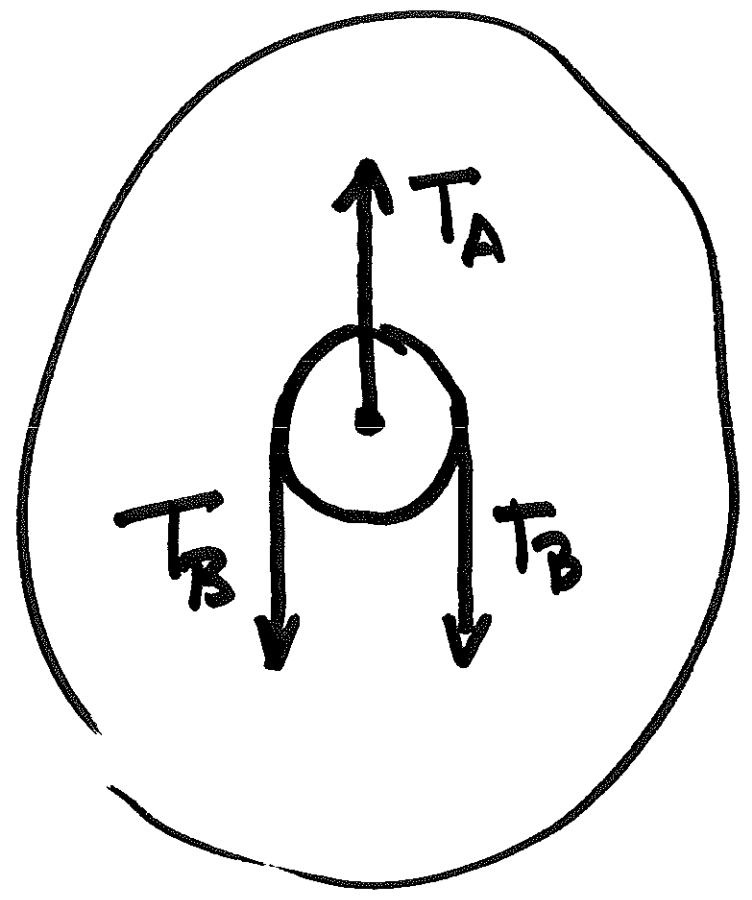
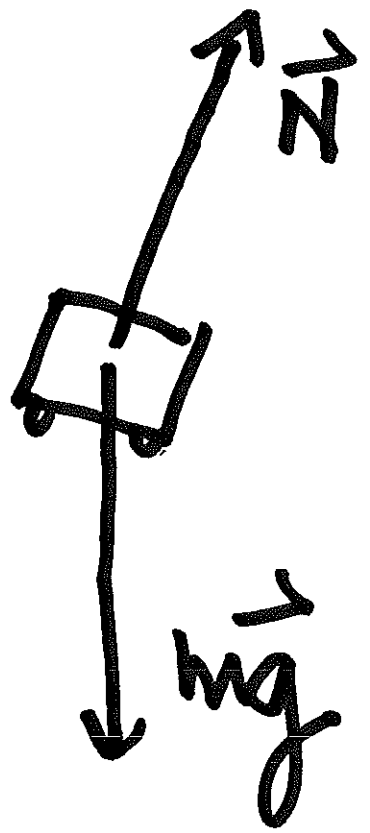
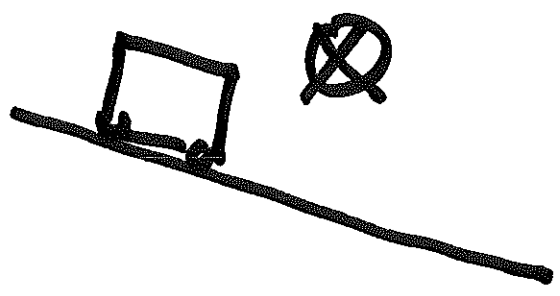
2018-09-25

- Exam I
- Grades Integrity
- Questions.
- Ski jump.

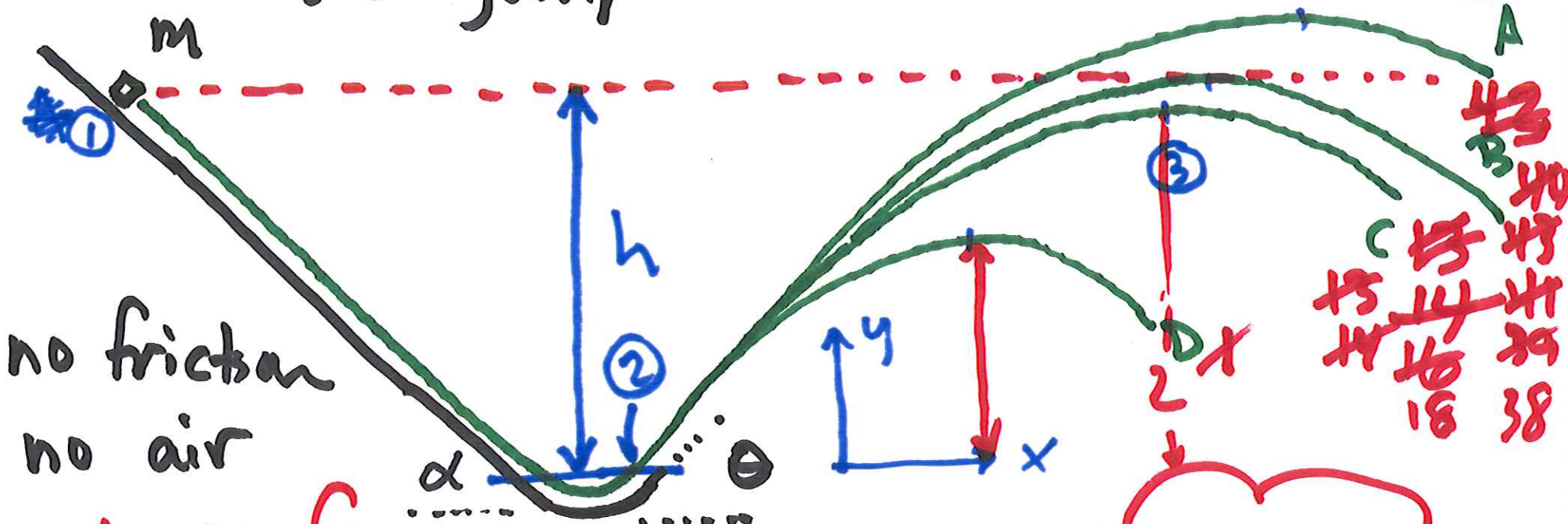
- Energy $\left\{ \begin{array}{l} \text{kinetic} \\ \text{potential.} \end{array} \right.$
- Conservation Law.
- Newton's Laws.

(Tutoring update!)

(Textbook!)

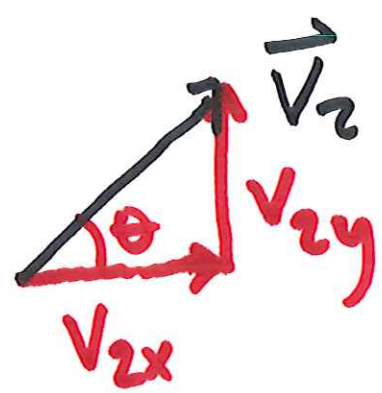


"Not a ski jump"



release from rest

$\theta = 35^\circ$
 $\sin \theta = 0.57$
 $\cos \theta = 0.82$



$|\vec{V}_{2x}| = |\vec{V}_2| \cos \theta$

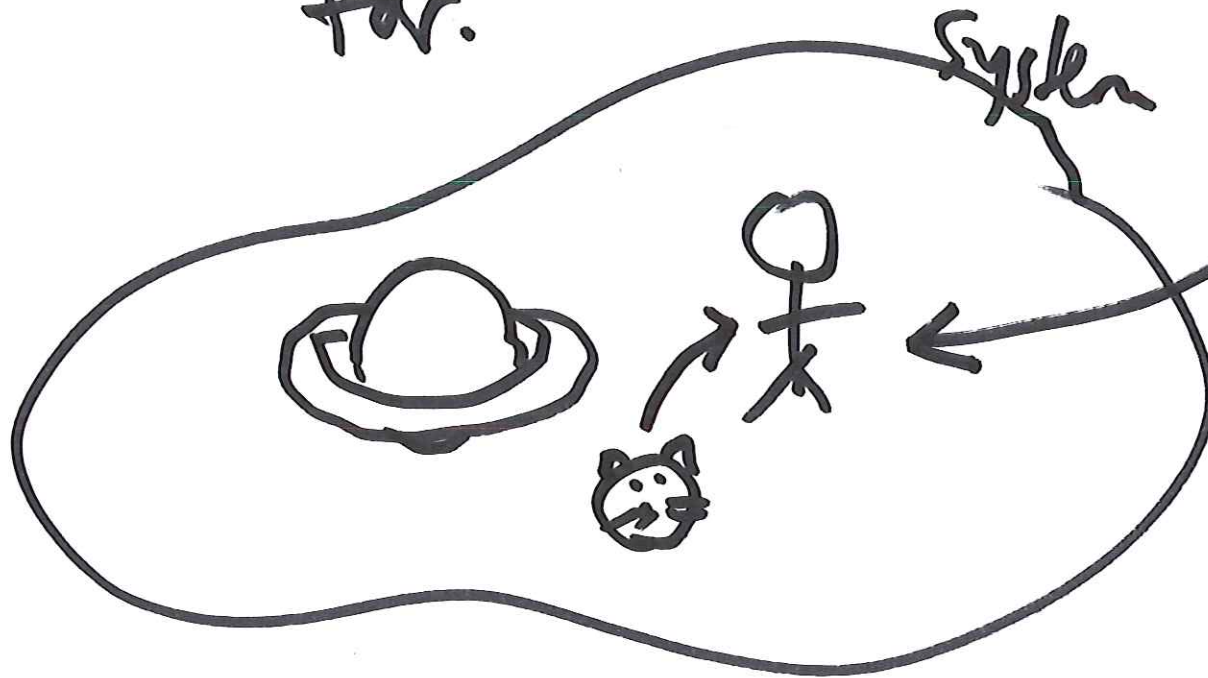
trig
vectors
components
dot products

$|\vec{V}_{2y}| = |\vec{V}_2| \sin \theta$

Conservation law:

~~Energy doesn't change~~

Energy changes can be accounted
for.



- conserved
- invariant

Noether

$$\textcircled{1}: KE = \frac{1}{2} m v_1^2 = 0$$

(at rest!)

$$PE = mgh - \text{Hogg says!}$$

$$\textcircled{2}: KE = \frac{1}{2} m v_2^2$$

$$PE = 0 - \text{at the reference point!}$$

note: by Cons. of E: $mgh = \frac{1}{2} m v_2^2$

$$KE = \frac{1}{2} m (v_x^2 + v_y^2)$$

$$|\vec{v}_2| = \sqrt{2gh}$$

$$KE = \frac{1}{2} m \vec{v} \cdot \vec{v}$$

$$v_x = \sqrt{2gh} \cdot \cos 35^\circ = 0.82 \sqrt{2gh}$$

0.82

$$v_y = \sqrt{2gh} \cdot \sin 35^\circ = 0.57 \sqrt{2gh}$$

$$\textcircled{3} \text{ PE} = mgh_3$$

$$\text{PE} = 0.35 \cdot mgh$$

$$\text{KE} = \frac{1}{2} mV_3^2$$

$$= \frac{1}{2} mV_2^2$$

$$= 0.65 \times \frac{1}{2} mV_2^2$$