

NYU Physics I

2018-10-04

- Ps 4

- Qs

- collision

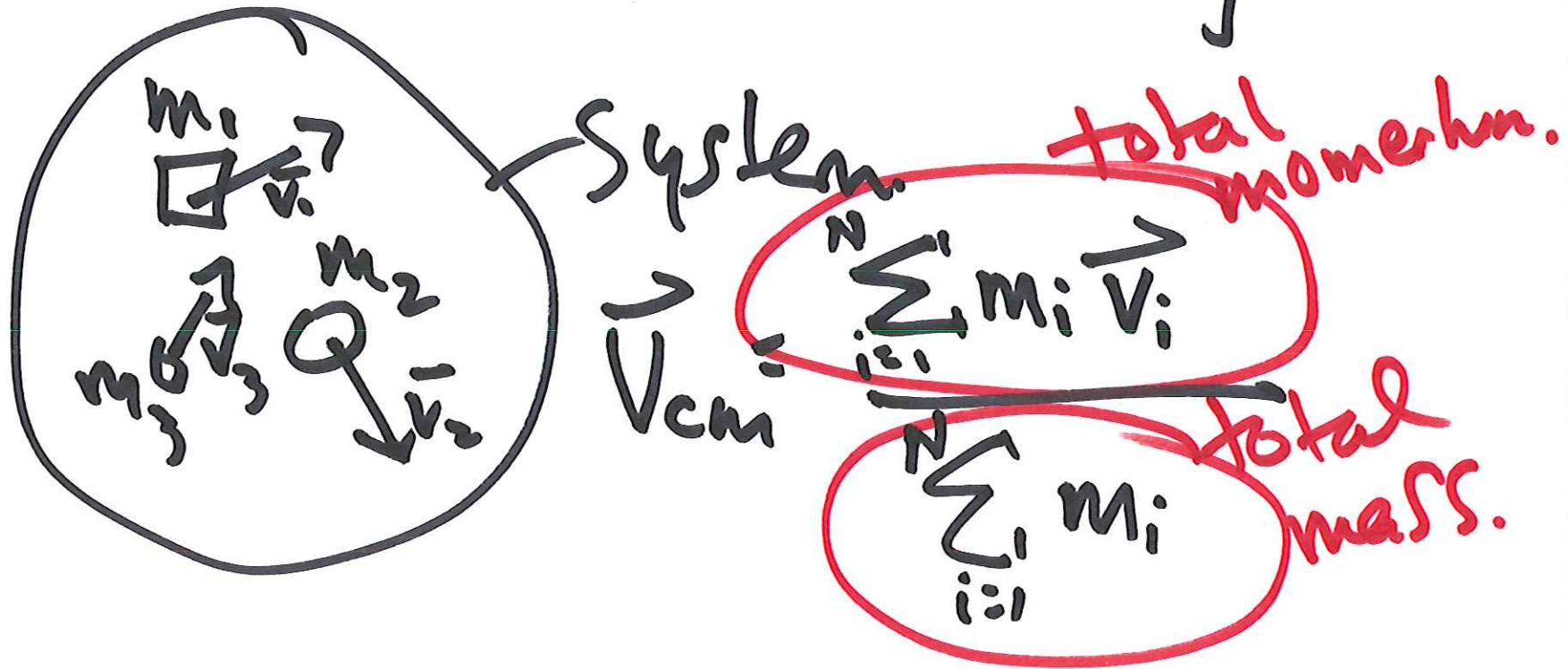
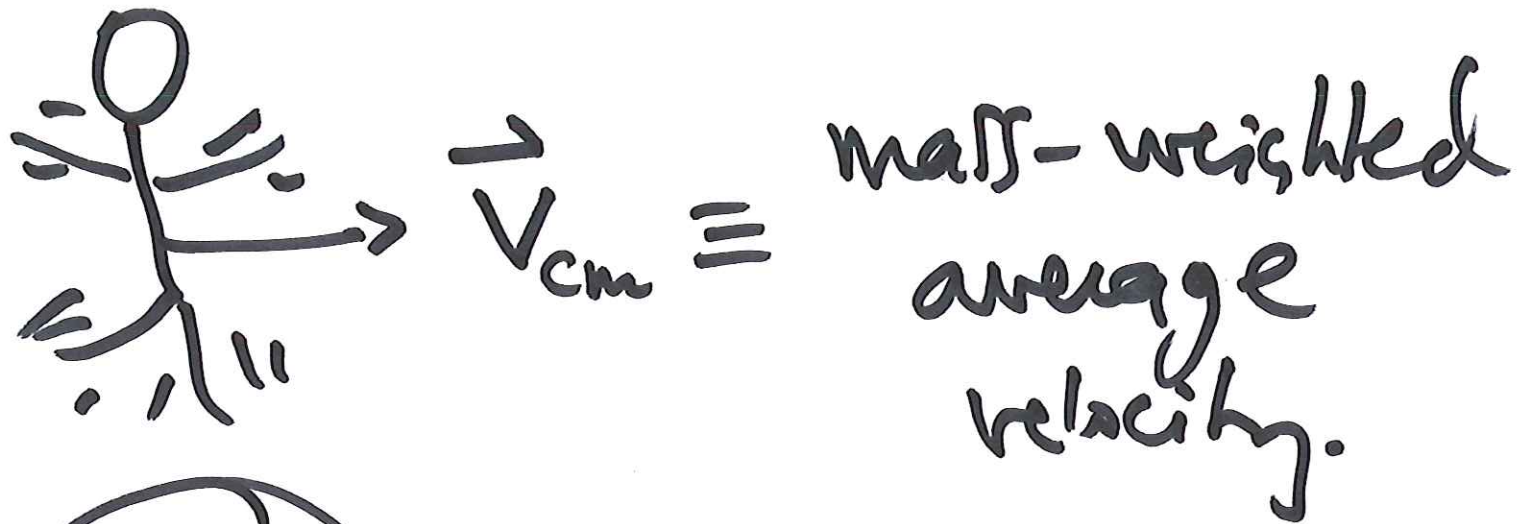
- exam 2.

momentum

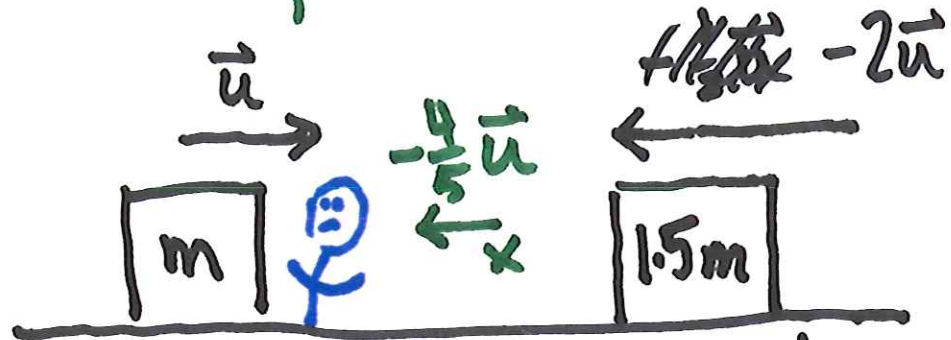
center of mass

impulse

collision.



before, lab.



$$\vec{p} = m\vec{u} - 3m\vec{u} = -2m\vec{u} \text{ air track}$$

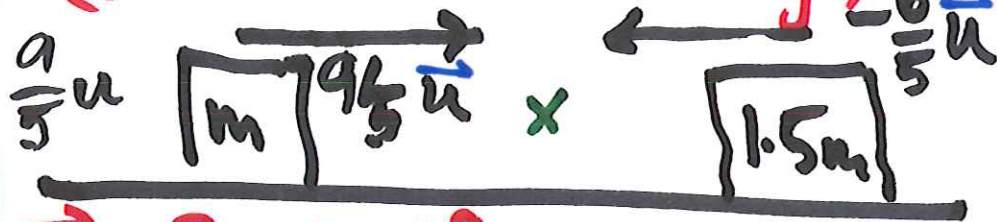
$$KE = \frac{1}{2}mu^2 + \frac{1}{2}(1.5m)(4u^2) = \frac{7}{2}mu^2$$

$$m_{\text{tot}} = 2.5m$$

after, lab

add  $\frac{4}{5}u$

before, com. (skateboard)  
(Galilean relativity)



$$\vec{p} = \frac{9}{5}m\vec{u} - \frac{18}{10}m\vec{u} = \vec{0}$$

$$KE = \frac{1}{2}m\left(\frac{9}{5}u\right)^2 + \frac{1}{2}(1.5m)\left(\frac{6}{5}u\right)^2 =$$

before, lab:  $\vec{P}_{\text{total}} = -2m\vec{u}$

$$M_{\text{total}} = 2.5m$$

$$\vec{v}_{\text{cm}} = \frac{\vec{P}_{\text{total}}}{M_{\text{total}}} = -\frac{4}{5}\vec{u}$$

$$KE = \frac{1}{2}mv^2 = \frac{p^2}{2m}$$

$$\sqrt{50} = 7$$

$$5\sqrt{2} = 7$$

$$\sqrt{200} = 14$$

$$\cos 15^\circ = 0.97$$

$$\sin 15^\circ = 0.26$$

$$\tan 15^\circ = 0.27$$

