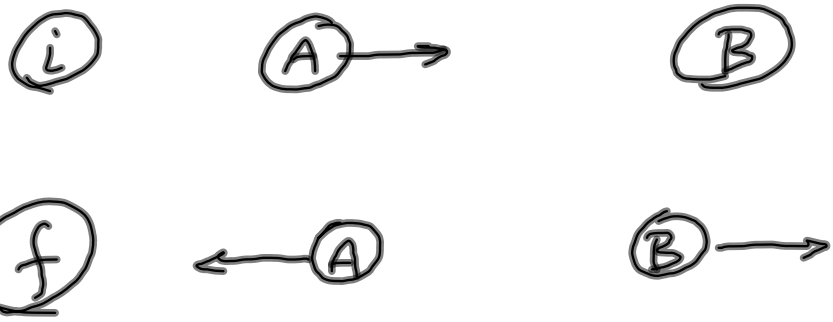
Qs on MP?

(Friday's HW Quiz may be taken in class today, or after school)

(the retake for Chap 6&7 test will be a take-home)

Dec 15-11:33 AM

AIR PUCKS



CONSERVATION OF MOMENTUM

$$P_i = P_f$$

$$m_A v_{A_i} + m_B v_{B_i} = m_A v_{A_f} + m_B v_{B_f}$$

$$\Delta K = K_f - K_i$$

$$\Delta K = \left(\frac{1}{2} m_A v_{A_f}^2 + \frac{1}{2} m_B v_{B_f}^2\right) - \left(\frac{1}{2} m_A v_{A_i}^2 + \frac{1}{2} m_B v_{B_i}^2\right)$$

BETWEEN PERFECT INELASTIC & PERFECT ELASTIC

BALLISTIC PENDULUM

START w/ CONS. OF MOM.

$$P_i = P_f$$

$$mv_0 = (m+M)V$$

$$V = \frac{m v_0}{m+M}$$

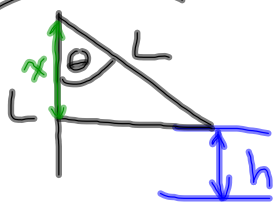
THEN USE CONS. OF E.

$$K_i = U_{gf}$$

$$\frac{1}{2}(m+M)v^2 = (m+M)gh$$

$$\frac{1}{2}(m+M)v^2 = (m+M)gL(1-\cos\theta)$$

$$\frac{v^2}{2} = gL(1-\cos\theta)$$



$L = x + h$

$h = L - x$

$h = L - L\cos\theta$

- NEED v_0 IN EQ'N
- GET FROM CONS OF MOM.

$$V = \frac{m v_0}{m+M}$$

$$\left(\frac{mv_0}{m+M}\right)^2 = 2gL(1-\cos\theta)$$

$$v_0^2 = \frac{2gL(1-\cos\theta)(m+M)^2}{m^2}$$

$$v_0 = \frac{m+M}{m}\sqrt{2gL(1-\cos\theta)}$$

$$= \left(1+\frac{M}{m}\right)\sqrt{2gL(1-\cos\theta)}$$

FOR 2ND PART, $\left(\frac{V_{0g}}{V_{0w}}\right)$, MAKE $L=1$, SOLVE FOR EACH V_0, THEN CALC RATIO.

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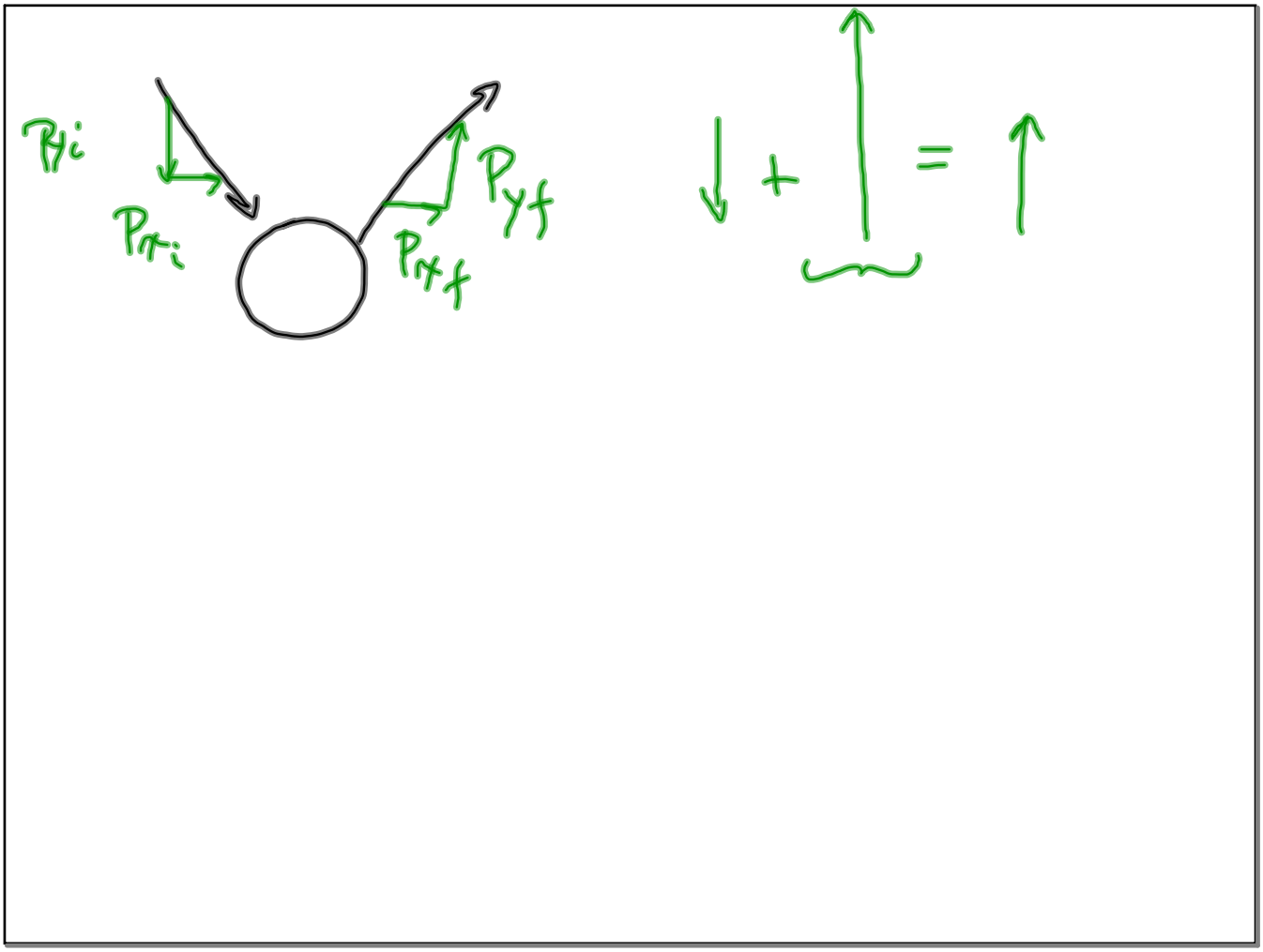

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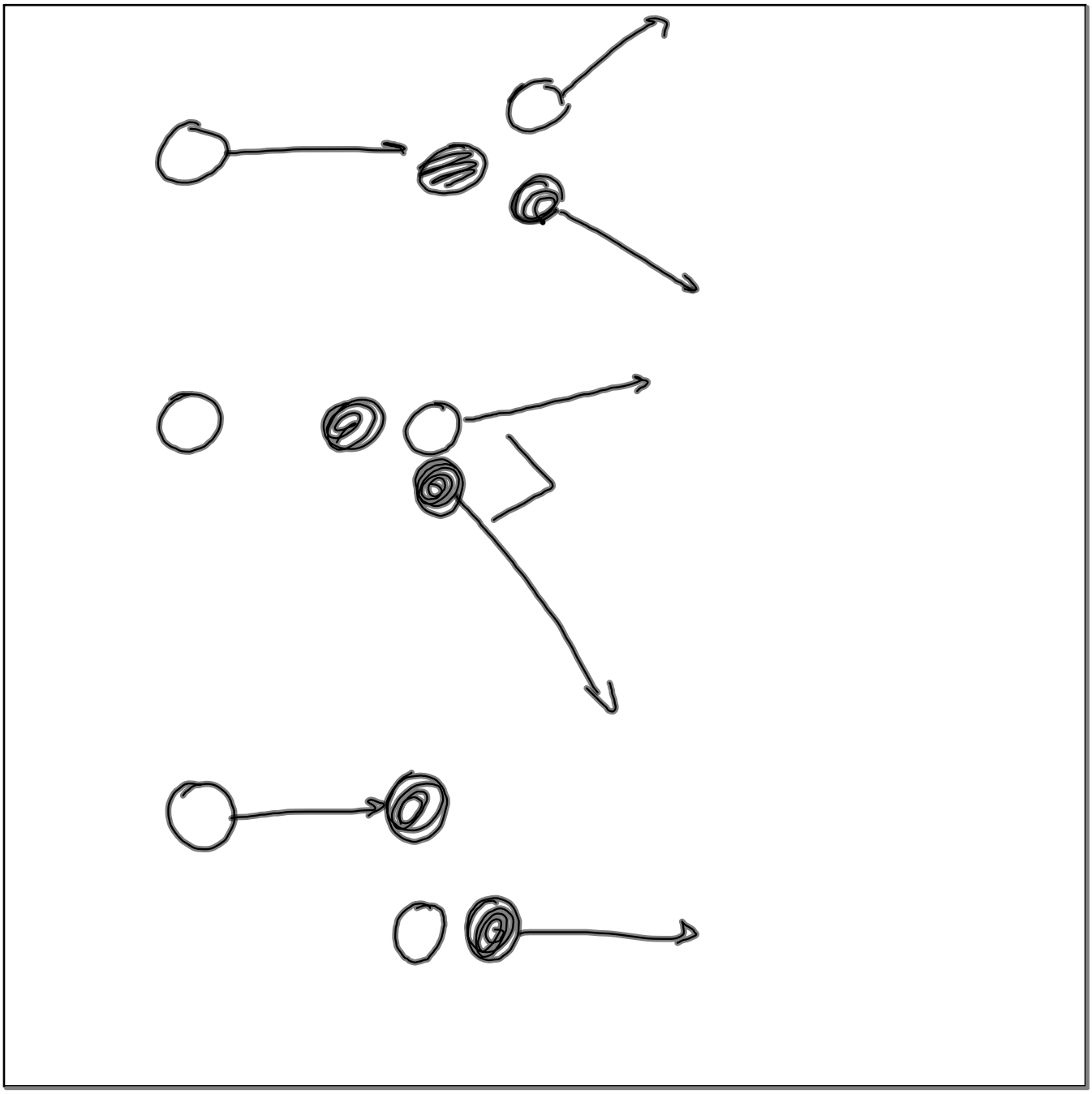

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$p_i = p_f$ θ_c θ_g

x $m_c v_i = m v_c \cos\theta + m v_g \cos\theta$

$v_i = v_c \cos\theta + v_g \cos\theta$

y $0 = m v_c \sin\theta - m v_g \sin\theta$

$v_c = v_g$

k $k_i = k_f$

$\frac{1}{2} m v_i^2 = \frac{1}{2} m v_c^2 + \frac{1}{2} m v_g^2$

$v_i^2 = v_c^2 + v_g^2$

$v_i^2 = 2 v_c^2$

$v_i = \sqrt{2}\, v_c$

$v_i = v_c \cos\theta + v_g \cos\theta$

$\sqrt{2}\, v_c = 2 v_c \cos\theta$

$\cos\theta = \frac{\sqrt{2}}{2}$

$\theta = \arccos\left(\frac{\sqrt{2}}{2}\right)$

$\theta = 45^\circ$

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