

exp 2:

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- The aim: test the Law of conservation of linear momentum by calculate the R ratio.

- Theory :-

The Law of conservation of linear momentum states that "the linear momentum of an isolated system is conserved"

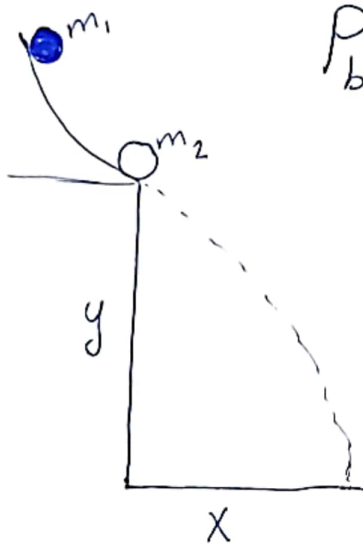
$$\vec{P} = m\vec{v} \quad \vec{P} = \sum_{i=1}^N m_i \vec{v}_i$$

many particle

$$\vec{P}_{\text{before}} = \vec{P}_{\text{after}}$$

$$m_1 v_{1b} + m_2 v_{2b} = m_1 v_{1a} + m_2 v_{2a} \quad (v_{2b} = 0)$$

$$R = \frac{\vec{P}_{\text{after}}}{\vec{P}_{\text{before}}} = \text{Should equal 1 why?!}$$



$$y = \frac{1}{2} g t^2$$

$$\therefore t = \sqrt{\frac{2y}{g}}$$

$$v = \frac{x}{t}$$

$$v = \frac{x}{\sqrt{\frac{2y}{g}}}$$

← velocity

$$R = \frac{m_1 v_{1a} + m_2 v_{2a}}{v_{1b} m_1}$$

$$R = \left(m_1 \frac{x_{1a}}{\sqrt{\frac{2y}{g}}} + m_2 \frac{x_{2a}}{\sqrt{\frac{2y}{g}}} \right) / \frac{x_{1b} m_1}{\sqrt{\frac{2y}{g}}} = \frac{m_1 x_{1a} + m_2 x_{2a}}{m_1 x_{1b}}$$

- The uncertainty :-

ⓐ

$$R = \frac{m_1 \bar{x}_{1a} + m_2 \bar{x}_{2a}}{m_1 \bar{x}_{1b}} = \frac{A}{B}$$

نتیجہ

$$\frac{\Delta R}{R} = \frac{\Delta A}{A} + \frac{\Delta B}{B}$$

$$\Delta A = m_1 \Delta x_{1a} + x_{1a} \Delta m_1 + m_2 \Delta x_{2a} + x_{2a} \Delta m_2$$

$$\Delta B = m_1 \Delta x_{1b} + x_{1b} \Delta m_1$$

$$\Delta m_1 = \Delta m_2 = \text{اسٹریٹجی پر پیمائش}$$

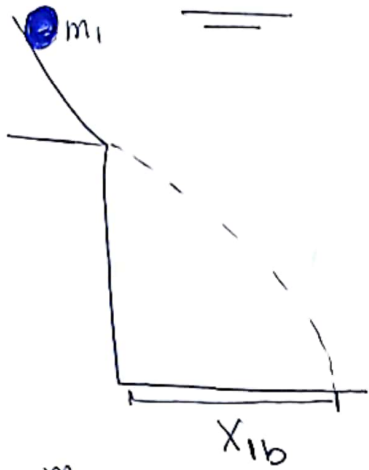
$$\Delta x_{1a}, \Delta x_{2a}, \Delta x_{1b} \rightarrow$$

خطا بشری

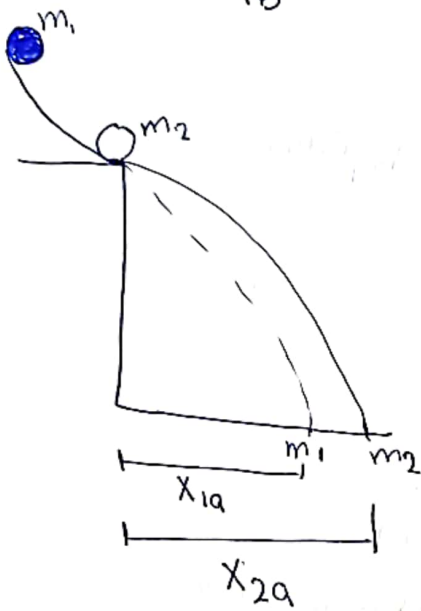
تجربہ + ماسٹرنگ

Procedure:-

(3)



نقیس X_{1b} (گھرات)



نقیس کل (گھرات) X_{2a}, X_{1a}

→ Calculate the average values for

$$\bar{X}_{1b}, \bar{X}_{1a}, \bar{X}_{2a} \quad \#$$

→ m_1, m_2 (میں کی جانے)

$$\therefore R = \frac{m_1 \bar{X}_{1a} + m_2 \bar{X}_{2a}}{m_1 \bar{X}_{1b}}$$