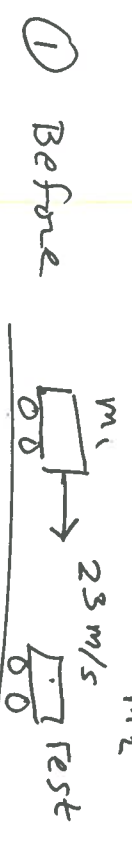


08 - one D collision



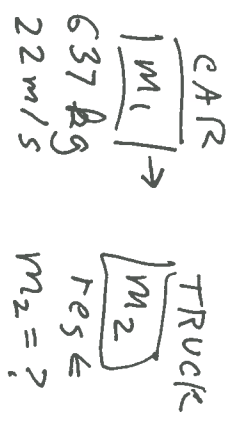
After $M \rightarrow v = ?$

$$m_1 v_1 + m_2 v_2 = M v$$

$$(2.8)(23) = (23.27)v$$

$$v = 2.767 \approx 2.8 \text{ m/s}$$

② Before



$$637 + m \rightarrow 7.7 \text{ m/s}$$

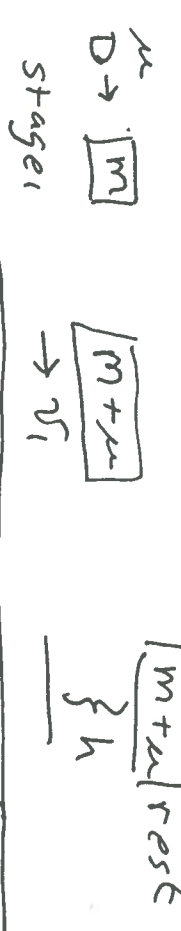
Let $m_2 = m = \text{mass of truck}$

$$(22)(637) = (637 + m)(7.7)$$

$$m = 1183 \text{ kg}$$

$$m = 1183 \text{ kg}$$

③ Ballistic Pendulum



Stage 1
 $P = m v_0$
 $v_0 = ?$

$$m v_0 = (m + M) v_1$$

$$\frac{1}{2} (m + M) v_1^2 = (m + M) g h$$

$$v_1^2 = 2gh \quad \left\{ \begin{array}{l} v_1 = \sqrt{2gh} \\ v_0 = (m + M) v_1 \end{array} \right.$$

$$v_0 = \left(\frac{m + M}{m} \right) \sqrt{2gh}$$

$$u = 167 \text{ gm} = 0.167 \text{ kg} = u \text{ SI units}$$

$$m = 2.1 \text{ kg} \quad h = 65 \text{ cm} = 0.65 \text{ m} = h$$

$$v_0 = \frac{2.1 + 0.167}{0.167} \sqrt{2(9.8)(0.65)}$$

$$v_0 = 48.5 \text{ m/s}$$

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