Momentum ——vector——→ conservation mechanics
$P = mv$

energy – scalar

linear momentum – vector

angular momentum – vector

M v $P = Mv$ $F = ma$

$= m\Delta v$

m v $P = mv$ $= \frac{\Delta(mv)}{\Delta t}$

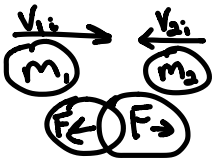
Impulse

$F\Delta t = \Delta P$ $= \frac{\Delta P}{\Delta t}$

↑ impulse ↑ Δ in momentum $\therefore \Delta v$

$F_{\Delta t} = \Delta P$

$F\Delta t = \Delta P$



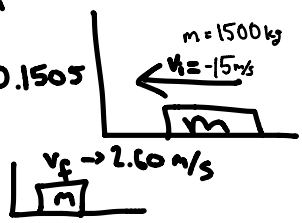
$\Delta F = 0$

$F_{12}\Delta t = m_2 v_{2f} - m_2 v_{2i}$

$F_{21}\Delta t = m_1 v_{1f} - m_1 v_i$

Given

$\Delta t = 0.150s$



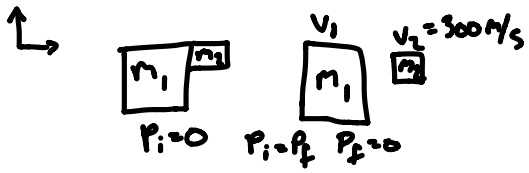
Find a) I b) F

Solve a) $I = p_f - p_i$ b) $F\Delta t = \Delta P$

$= mv_f - mv_i$ $I = F\Delta t$

$I = 26400$ kgm/s $F = \frac{I}{\Delta t} = \frac{26400}{0.150} \rightarrow F = 176{,}000N$

Given $m_1 = 7.0\,kg$ $m_2 = 0.02\,kg$



$P_f = 0$

$m_1 v_1 + m_2 v_2 = 0$

$v_1 = \frac{-m_2 v_2}{m_1}$

$v_1 = 0.86\,m/s$