

IMPULSE - MOMENTUM

Newton's SECOND LAW  $\Rightarrow$

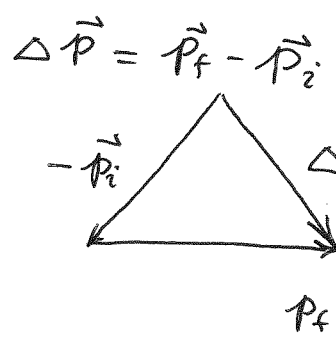
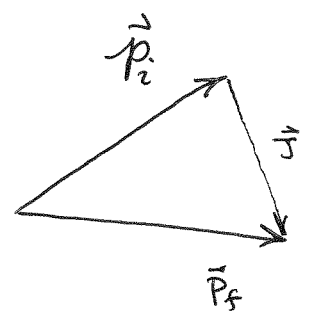
$\sum \vec{F} = \frac{\Delta \vec{p}}{\Delta t}$  VECTOR EQUATION

"Net Force"

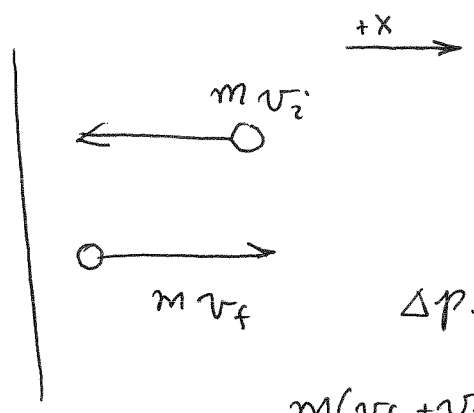
$\Delta \vec{p} = (\sum \vec{F}) \Delta t$  IMPULSE Momentum Theorem  
 $\equiv \vec{J} \equiv \text{IMPULSE}$

IMPULSE  $\Rightarrow$  "FORCE ACTS THROUGH time"

$\vec{J}$  Changes momentum  $\vec{p}$



$\Delta \vec{p} = \vec{p}_f - \vec{p}_i \equiv \vec{J} = \vec{F} \Delta t$



$\Delta \vec{p} = \vec{p}_f - \vec{p}_i$

$\Delta p = m v_f - (-m v_i) = +m(v_f + v_i) = \vec{J}$

$m(v_f + v_i) = \vec{F} \Delta t$

$|\vec{F}| = \left| \frac{\Delta \vec{p}}{\Delta t} \right| = \frac{m(v_f + v_i)}{\Delta t}$