Ch6 9-5-13

momentum = mass • velocity

vector

$p = mv$ = momentum

one-dimension

1D

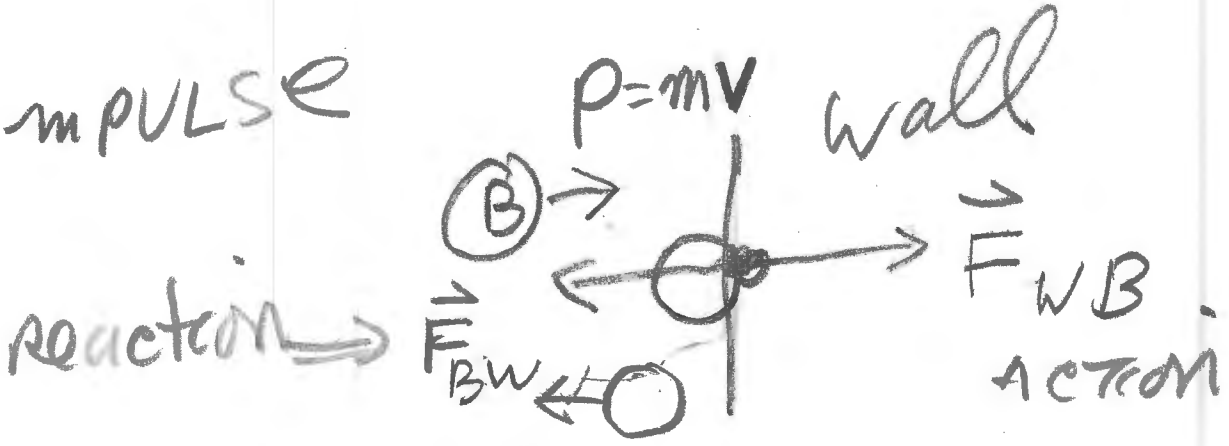
$\rightarrow v > 0$

$p > 0$

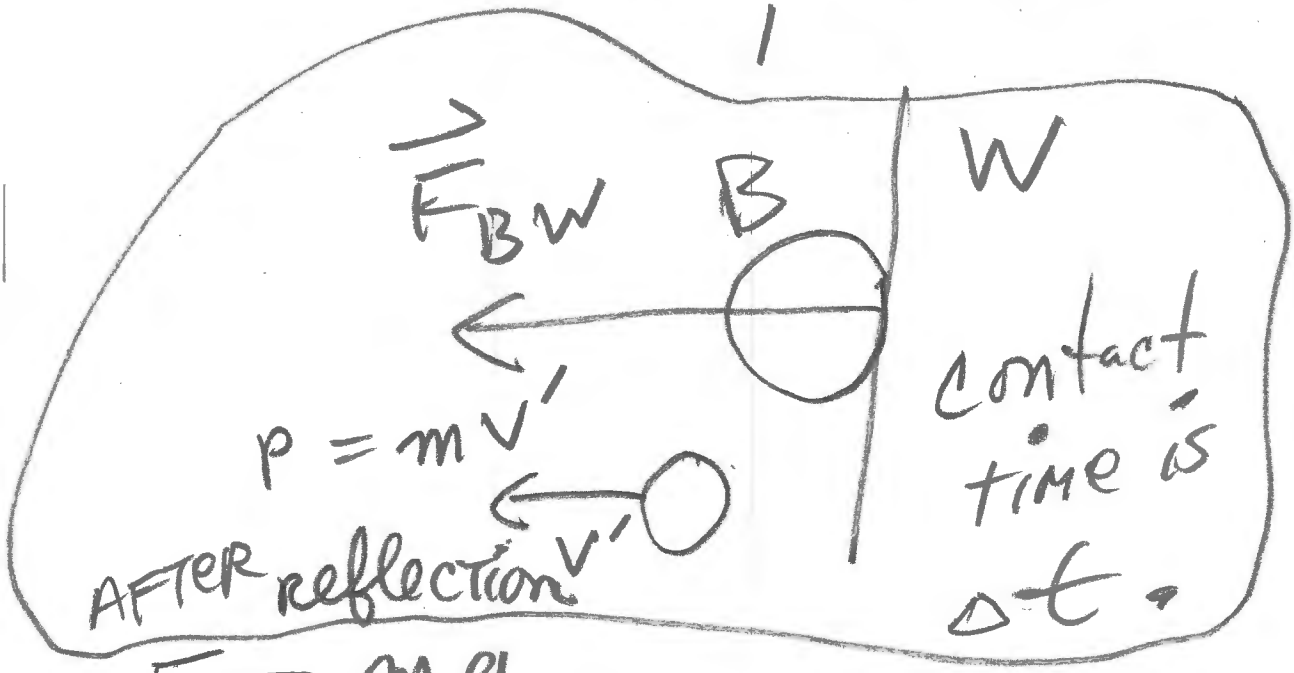
$\leftarrow v < 0$

$p < 0$

Impulse



During time Δt of contact between ball & wall:



$F = ma$

$F = m\frac{\Delta v}{\Delta t}$

$\Delta t \approx 0.001(s)$

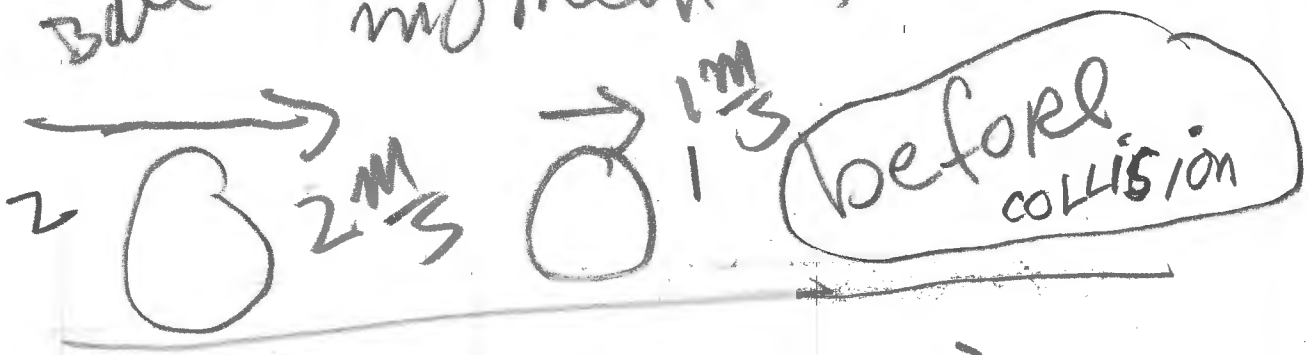
$F \cdot \Delta t = m \cdot \Delta V$

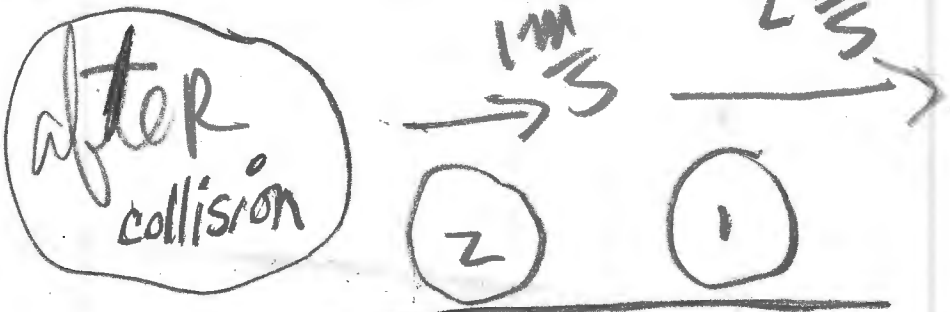
$F \cdot \Delta t = \Delta(mv) =$ IMPULSE

$F \cdot \Delta t = mv' - mv$

game of pool:

2 billiard balls: conservation of momentum





$$|a| = \left|\frac{\Delta v}{\Delta t}\right|$$

Pool balls $m_1 = m_2$

$$|\vec{F}_{21}| = |\vec{F}_{12}|$$ 3RD LAW

$$|m_2 \cdot a_2| = |m_1 \cdot a_1|$$

$$m \cdot \left(\frac{1\frac{m}{s} - 1\frac{m}{s}}{0.001s}\right) = m \cdot \left(\frac{2\frac{m}{s} - 1\frac{m}{s}}{0.001s}\right)$$

(4

$m_2 \cdot 2\frac{m}{5} + m_1 \cdot \frac{m}{5} = m_2 \cdot \frac{m}{5} + m_1 \cdot 2\frac{m}{5}$

$m_1 = m_2 = m$

conservation of momentum

Note: $m_1 \neq m_2$ in general.