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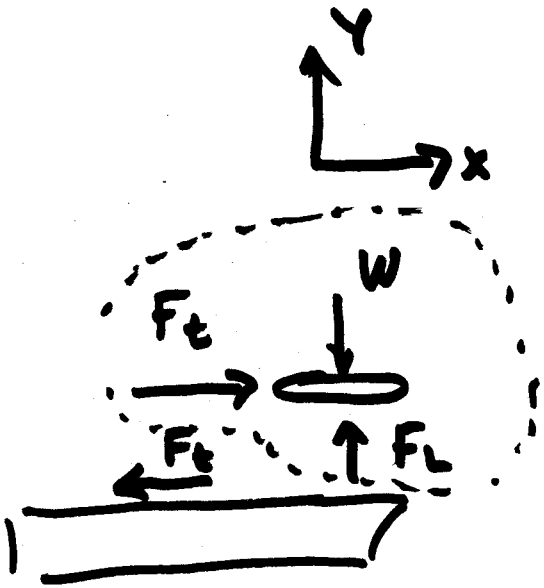

$$\int_{t_1}^{t_2} F_t(t)\,dt = mv_{x_2} - mv_{x_1} \qquad (x\text{-dir})$$

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Conservation of Momentum for a System of Ptcles (Section 15.3)

For a system of ptcles

$$\sum m_i \vec{v}_{i1} + \int_{t_1}^{t_2} \sum \vec{F}_{ei}(t)\, dt = \sum m_i \vec{v}_{i2}$$

$\sum \vec{F}_{ei}$: externally applied forces

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$$\sum m_i \vec{v}_{i1} = \sum m_i \vec{v}_{i2}$$

Internal forces need not apply!!

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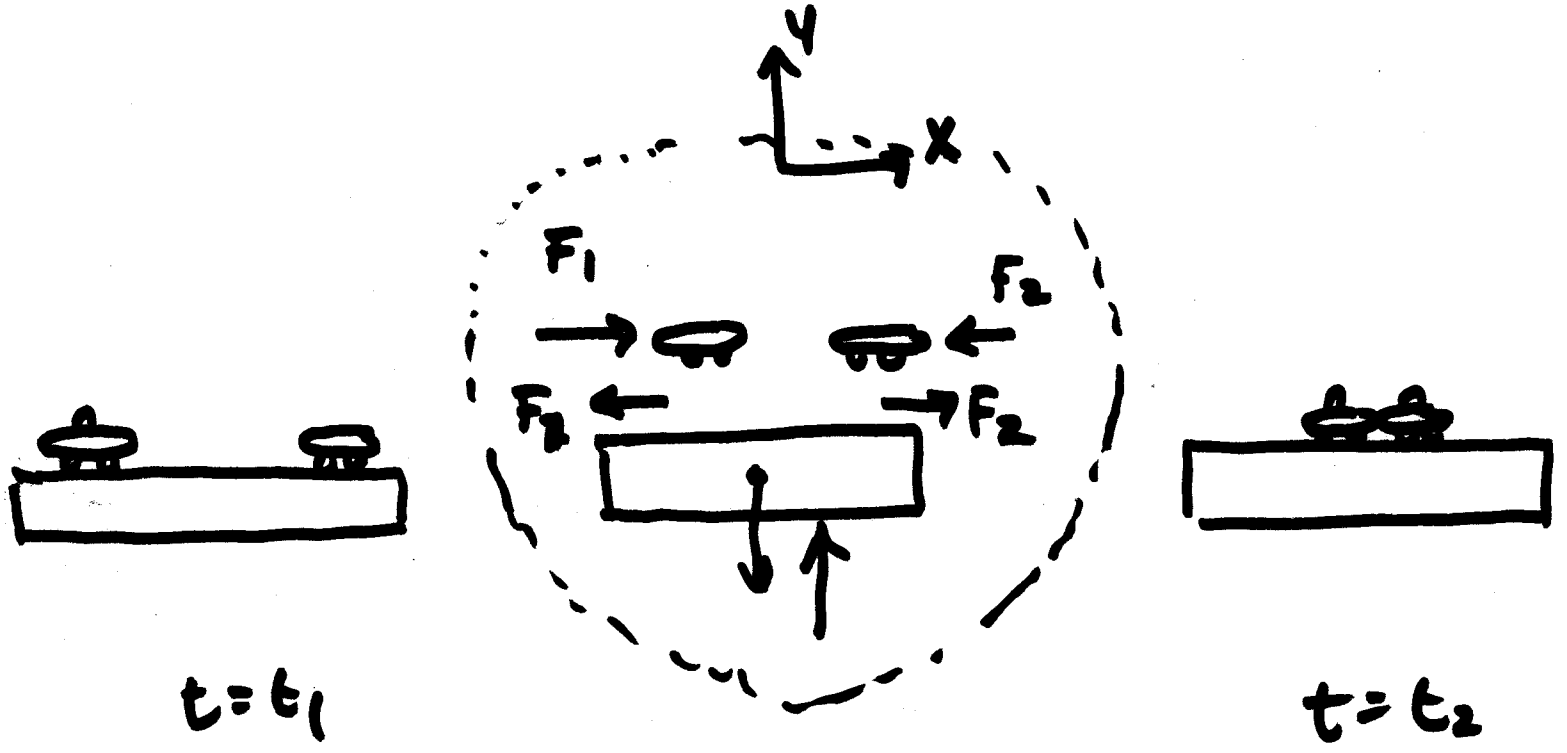

$$\sum m_i v_{i1} + \cancel{\int_{t_1}^{t_2} \vec{F}_{ext}(t)\,dt} = \sum m_i v_{i2}$$