

Newton's second law:

$$\vec{F}_R = m\vec{a}, \quad (1)$$

$$\vec{F}_R = \sum_i \vec{F}_i, \quad (2)$$

where  $\vec{F}_R$  - resultant force and  $\vec{F}_i$  are forces acting on the body.

Momentum ( $\vec{P}$ ) can be expressed as:

$$\vec{P} = m\vec{V} = \vec{F}\Delta t. \quad (3)$$

Where velocity ( $\vec{V}$ ) is equal to

$$\vec{V} = \vec{a}\Delta t \quad (4)$$

or, divided by components,

$$V_x = a_x\Delta t, \quad (5)$$

$$V_y = a_y\Delta t. \quad (6)$$

Work and energy can be found using

$$\vec{A} = \vec{F} \cdot \vec{d} \quad (7)$$

$$E_k = \frac{mV^2}{2}, \quad (8)$$

$$E = A, \quad (9)$$

where A is the work exerted on the body and E is the energy of the body and "·" is the dot product or scalar product.