$$d = \frac{1}{2}\, a\, t^2$$

$$\vec{v} = \frac{d\vec{x}}{dt}$$

$$\vec{a} = \frac{d\vec{v}}{dt} = \frac{d^2\vec{x}}{dt^2}$$

$$\vec{a} = \frac{d\vec{v}}{dt} \qquad \Longrightarrow \qquad \vec{v} = \int \vec{a}\ dt$$

$$\vec{v} = \vec{a} \int dt$$

$$\vec{v} = \vec{v}_i\ +\ \vec{a}\, t$$

$$\vec{v} = \frac{d\vec{x}}{dt} \qquad \Longrightarrow \qquad \vec{x} = \int \vec{v}\ dt$$

$$\vec{x} = \int (\vec{v}_i\ +\ \vec{a}\, t)\, dt$$

$$\vec{x} = \int \vec{v}_i\ dt \quad + \quad \int \vec{a}\, t\ dt$$

$$\vec{x} = \vec{x}_i \quad + \quad \vec{v}_i\ t \quad + \quad \frac{1}{2}\vec{a}\ t^2$$

$$\vec{x} = \vec{x}_i \quad + \quad \frac{1}{2}(\vec{v}_i + \vec{v}_f)\ t$$

$$v_f^2 - v_i^2 = 2\ \vec{a}\ (\vec{x}_f - \vec{x}_i)$$