$$\bar{v} = \frac{d\bar{s}}{dt}$$

$$\bar{a} = \frac{d\bar{v}}{dt}$$

$$a\,ds = v\,dv$$

$$v = v_o + at$$

$$v^2 = v_o^2 + 2a(s - s_o)$$

$$s = s_o + v_o t + \frac{1}{2}at^2$$

$$\bar{v} = v\,\hat{u}_t$$

$$\bar{a} = \dot{v}\,\hat{u}_t + \frac{v^2}{\rho}\,\hat{u}_n$$

$$\bar{v} = \dot{r}\,\hat{u}_r + r\dot{\theta}\,\hat{u}_\theta$$

$$\bar{a} = \left(\ddot{r} - r\dot{\theta}^2\right)\hat{u}_r + (2\dot{r}\dot{\theta} + r\ddot{\theta})\,\hat{u}_\theta$$

$$\bar{r}_A = \bar{r}_B + \bar{r}_{A/B}$$

$$\bar{v}_A = \bar{v}_B + \bar{v}_{A/B}$$

$$\bar{a}_A = \bar{a}_B + \bar{a}_{A/B}$$

$$dU = \bar{F} \cdot d\bar{r}$$

$$dV = -\bar{F} \cdot d\bar{r}$$

$$\Delta T = \frac{1}{2}m(v_2^2 - v_1^2)$$

$$\Delta V_g = mg\Delta h$$

$$\Delta V_e = \frac{1}{2}k(x_2^2 - x_1^2)$$

$$U = \Delta T + \Delta V_g + \Delta V_e$$

$$\bar{G} = m\bar{v}$$

$$\int_{t_1}^{t_2} \Sigma\bar{F}\,dt = \bar{G}_2 - \bar{G}_1$$

$$\bar{H}_o = \bar{r} \times m\bar{v}$$

$$\Sigma\bar{M}_o = \dot{\bar{H}}_o$$

$$\int_{t_1}^{t_2} \Sigma\bar{M}_o\,dt = \bar{H}_{o2} - \bar{H}_{o1}$$