$\vec{v} = \frac{d\vec{r}}{dt}$ $v = \frac{ds}{dt}$ $\vec{v} = v\vec{e}_t$

$\vec{a} = \frac{d\vec{v}}{dt}$ $\vec{a} = \frac{dv}{dt}\vec{e}_t + \frac{v^2}{\rho}\vec{e}_n$

$\theta(t)$ $\omega = \frac{d\theta}{dt}$ $\alpha = \frac{d\omega}{dt}$ $a_n = \frac{v^2}{R} = R\omega^2$

$\vec{v} = \vec{v}_0 + \int_{t_0}^{t} \vec{a}dt$ $\vec{r} = \vec{r}_0 + \int_{t_0}^{t} \vec{v}dt$

$\vec{v} = \vec{v}' + \vec{v}_{SS'}$ $\vec{v} = \vec{v}' + \vec{\omega} \times \vec{r}'$ $\vec{a}' = \vec{a} - 2\vec{\omega} \times \vec{v}' - \vec{\omega} \times \vec{\omega} \times \vec{r}'$

$v_{\lim} = \sqrt{\frac{2F_g}{C\rho A}}$ $v = v_0 + at$ $x = x_0 + v_0 t + \frac{1}{2}at^2$

$\vec{F} = \frac{d\vec{p}}{dt}$ $\vec{F} = m\vec{a}$ $f_e = \mu_e N$ $f_c = \mu_c N$

$\vec{F}_{12} = -G\frac{m_1 m_2}{{r_{12}}^2}\hat{r}_{12}$ $\vec{F}_g = \vec{P} = -G\frac{mM_T}{{R_T}^2}\vec{e}_r = m\vec{g}$ $T^2 = \frac{4\pi^2}{GM}R^3$

$\vec{L} = \vec{r} \times \vec{p} = \vec{r} \times m\vec{v}$ $\vec{L} = mr^2\vec{\omega}$ $Potência - P = \frac{dW}{dt}$

$W = \int_A^B \vec{F}.d\vec{r}$ $W = E_{cB} - E_{cA}$ $W = E_{pA} - E_{pB}$ $E_c = \frac{1}{2}mv^2$

$E_p(y) = mgy$ $E_p(x) = \frac{1}{2}kx^2$ $E_p(r) = -G\frac{m_1 m_2}{r}$

$\vec{F} = -grad(E_p) = -(\frac{\partial E_p}{\partial x}\vec{e}_x + \frac{\partial E_p}{\partial y}\vec{e}_y + \frac{\partial E_p}{\partial z}\vec{e}_z)$ $\vec{F} = -\frac{dE_p}{dr}\vec{e}_r$ $E_B - E_A = W^{NC}$

$\vec{p} = m\vec{v}$ $\vec{J} = \Delta\vec{p}$ $\vec{J} = \int \vec{F}dt$

$$\vec{r}_{CM} = \frac{\sum_k m_k \vec{r}_k}{\sum_k m_k} \qquad \vec{v}_{CM} = \frac{\sum_k m_k \vec{v}_k}{\sum_k m_k} \qquad \vec{a}_{CM} = \frac{\sum_k m_k \vec{a}_k}{\sum_k m_k}$$

$$\vec{p} = M\vec{v}_{CM} \qquad \vec{F} = M\vec{a}_{CM} \qquad \vec{F}_{21} = \mu\,\vec{a}_{21} \qquad \frac{d\vec{L}}{dt} = \vec{\tau}_{ext}$$

$$I = \sum_k m_k R_k^{\ 2} \qquad I = \int R^2 dm = \int \rho R^2 dV \qquad I = I_{CM} + Md^2 \qquad \vec{\tau}_{ext} = I\vec{\alpha}$$

$$E_c = \frac{1}{2} I\omega^2 \qquad E_c = \frac{1}{2} M v_{TR}^{\ 2} + \frac{1}{2} I\omega^2$$

$$\frac{d^2x}{dt^2} + \frac{k}{m} x = 0 \qquad x = x_m \cos(\omega t + \delta) \qquad \omega = \sqrt{\frac{k}{m}} \qquad T = \frac{2\pi}{\omega}$$

$$\frac{d^2\theta}{dt^2} + \frac{g}{\ell}\theta = 0 \qquad \theta = \theta_m \cos(\omega t + \delta) \qquad \omega = \sqrt{\frac{g}{\ell}} \qquad \omega = 2\pi f$$

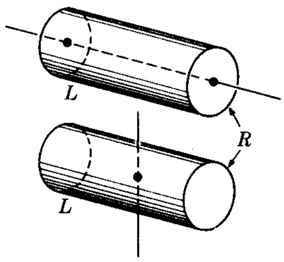
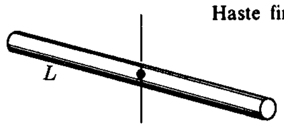
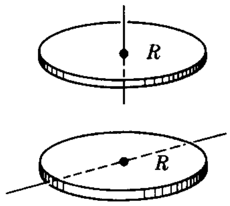
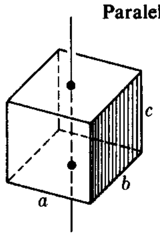
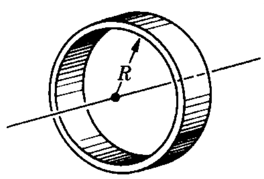
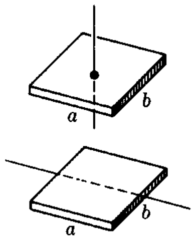
$$\frac{d^2x}{dt^2} + \frac{\lambda}{m}\frac{dx}{dt} + \frac{k}{m}x = 0 \qquad \frac{d^2x}{dt^2} + 2\gamma\frac{dx}{dt} + \omega_0^{\ 2} x = 0 \qquad x = x_m e^{-\gamma t}\cos(\omega t + \delta)$$

$$\frac{d^2\theta}{dt^2} + \frac{\lambda}{m}\frac{d\theta}{dt} + \frac{g}{l}\theta \qquad \frac{d^2\theta}{dt^2} + 2\gamma\frac{d\theta}{dt} + \omega_0^{\ 2}\theta = 0 \qquad \omega = \sqrt{\omega_0^{\ 2} - \gamma^2}$$

$$\frac{d^2x}{dt^2} + 2\gamma\frac{dx}{dt} + \omega_0^{\ 2} x = \frac{F_0}{m}\cos(\omega_f t) \qquad x_m = \frac{F_0 / m}{\sqrt{(\omega_f^{\ 2} - \omega_0^{\ 2})^2 + 4\gamma^2\omega_f^{\ 2}}}$$

$$\omega_R = \sqrt{\omega_0^{\ 2} - 2\gamma^2}$$

TABELA 10-1 *Raios de Giração de Alguns Sólidos Simples*

K^2	Eixo	K^2	Eixo
$\frac{R^2}{2}$ $\frac{R^2}{4} + \frac{L^2}{12}$	**Cilindro** 	$\frac{L^2}{12}$	**Haste fina** 
		$\frac{R^2}{2}$ $\frac{R^2}{4}$	**Disco** 
$\frac{a^2+b^2}{12}$	**Paralelepípedo** 	R^2	**Aro** 
$\frac{a^2+b^2}{12}$ $\frac{b^2}{12}$	**Placa retangular** 	$\frac{2R^2}{5}$	**Esfera**