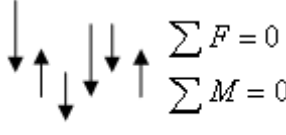
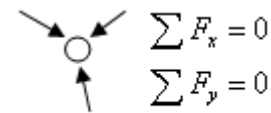
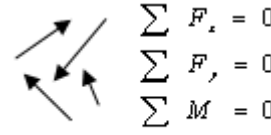


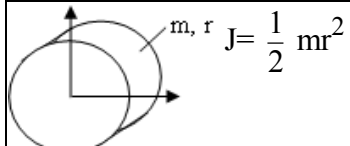
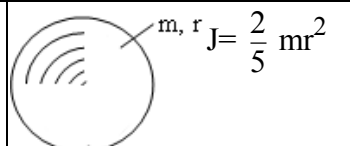
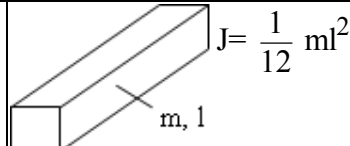
Kräftesystem

 $\sum F = 0$ $\sum M = 0$ paralleles K.S.	 $\sum F_x = 0$ $\sum F_y = 0$ zentrales K.S.	 $\sum F_x = 0$ $\sum F_y = 0$ $\sum M = 0$ allgemeines K.S.
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Freiheitsgrad $f_{ges} = 3 \cdot (n - 1) - \sum r_i$ (allgemein) $f_{ges} = 2 \cdot k - s - \sum r_{gestell}$ (Fachwerk)	Haftung und Reibung $H \leq \mu_0 \cdot N$; $R = \mu \cdot N$ (Coulomb) $S_2 \leq S_1 \cdot e^{\mu_0 \alpha}$; $S_2 = S_1 \cdot e^{\mu \alpha}$ (Eytelwein)
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lineare Bewegung (gleichförmig beschleunigt) $v(t) = v_0 + a \cdot t$ $s(t) = s_0 + v_0 \cdot t + \frac{1}{2} a t^2$	Drehbewegung (gleichförmig beschleunigte Rotation) $\omega(t) = \omega_0 + \alpha \cdot t$ $\varphi(t) = \varphi_0 + \omega_0 \cdot t + \frac{1}{2} \alpha t^2$ $v = r \cdot \omega$; $s = r \cdot \varphi$ (Rollen) $a_t = r \cdot \alpha$; $a_n = r \cdot \omega^2$
Dynamisches Grundgesetz $\sum F_x = m \cdot \ddot{x}$; $\sum F_y = m \cdot \ddot{y}$; $\sum M = J \cdot \ddot{\varphi}$	

Massenträgheitsmoment $J = \int r^2 dm$ Satz von Steiner: $J = J_0 + m d^2$

Zylinder	Kugel	Stab
 $J = \frac{1}{2} m r^2$	 $J = \frac{2}{5} m r^2$	 $J = \frac{1}{12} m l^2$

Energiesatz $E_{kinI} + E_{potI} + W_{zu} - W_{ab} = E_{kinII} + E_{potII}$

Schwerefeld	Feder	lin. Bewegung	rot. Bewegung	Reibung
$E_{pot} = m \cdot g \cdot h$ $F = m \cdot g$	$E_{pot} = \frac{1}{2} c \cdot \Delta l^2$ $F = c \cdot \Delta l$	$E_{kin} = \frac{1}{2} m \cdot v^2$ $F = m \cdot a$	$E_{kin} = \frac{1}{2} J \cdot \omega^2$ $M = J \cdot \alpha$	$W_R = \mu \cdot N \cdot s$ $R = \mu \cdot N$
Arbeit $P = F \cdot s + M \cdot \varphi$	Leistung $P = F \cdot v + M \cdot \omega$		Wirkungsgrad $\eta = \frac{P_{ab}}{P_{zu}} = 1 - \frac{P_v}{P_{zu}}$	