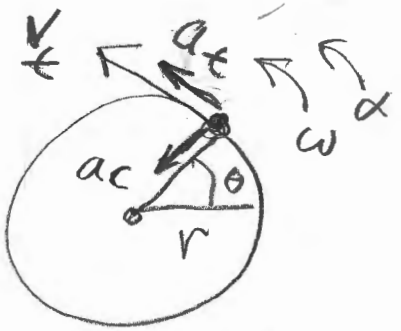
CH 9 "cheat" sheet

MOTION



$\omega = \frac{d\theta}{dt}$, $\alpha = \frac{d\omega}{dt}$

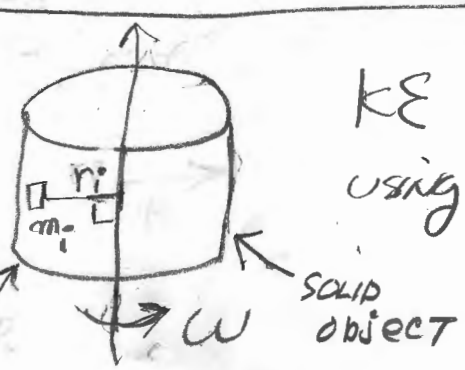
$v_t = r\omega$, $a_c = r\omega^2$

$a_t = \frac{dv_t}{dt}$.

see TABLE 9.1 for α = CONSTANT

ENERGY

Rotational kinetic energy



$KE = \frac{1}{2} I\omega^2$

using $KE = \sum \frac{1}{2} m_i r_i^2 \omega^2$

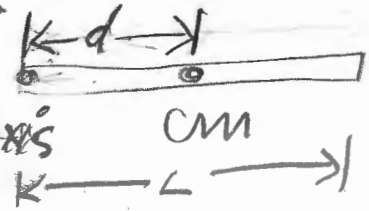
$= \frac{\omega^2}{2} \cdot \sum m_i r_i^2 = \frac{\omega^2}{2} I$

$I = \sum_i m_i r_i^2$

see table 9.2 for I RESULTS.

Parallel AXIS THEOREM $I_{AXIS} = I_{com} + Md^2$

ROD:



$I_{AXIS} = \frac{ML^2}{12} + M\left(\frac{L}{2}\right)^2 = \frac{ML^2}{3}$

PROBLEM CLASSES:

CLASS	THEMES	PROBLEMS
1	$KE_i + U_i = KE_f + U_f + HEAT$ $KE = \frac{1}{2} I\omega^2 + \frac{1}{2} mass \cdot v^2$	47, 68, 83, 84, 87, 89. OFTEN WE USE $v = \frac{V}{R}$.
2	$KE_{ROT} = \frac{1}{2} I\omega^2$	44. see EXAMPLE 9.7
3	I and $I_{AXIS} = I_{cm} + Md^2$	54, 56 and TRY 30.
4	MOTION	8, 16, 18, 20, 24, 24, 28.