Test 1

PH 112

Rotational K/D

I

Static Eq

Energy for rot. motion

Angular momentum

4-5 questions

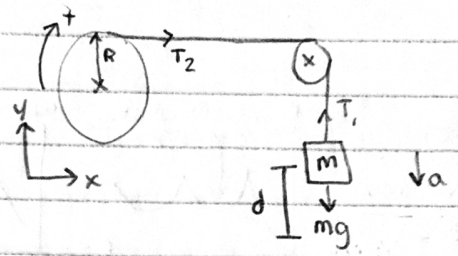
Example #3

$R = .2\,m$

$M = 1\,kg$

$a = .4\,m/s^2$ $\quad d = 10\,m$

$\alpha = ?$ $\quad T = ?$ $\quad I = ?$ $\quad \omega = ?$



a. $a_{tan} = r\alpha \quad \alpha = \frac{a}{r} = \frac{.4}{.2} = \boxed{2\ rad/s}$

b. $T - mg = -ma \quad T = mg - ma = 9.8 - .4 = \boxed{9.4\,N}$

c. $\tau_{net} = I\alpha \quad I = \frac{\tau}{\alpha} = \frac{TR}{\alpha} = \frac{9.4(.2)}{2} =$

d. $\Delta KE = -\Delta PE \quad \frac{1}{2}I\omega_2^2 - \frac{1}{2}I\omega_1^2 = mgd$

$\frac{1}{2}I\omega_2^2 = mgd + \frac{1}{2}I\omega_1^2$

$\omega_2 =$