6. $\begin{cases} E_{вр} = \frac{Iw^2}{2} \\ I = \frac{2}{5}mR^2 \\ w = 2\pi n \end{cases}$

$\Rightarrow E_{вр} = \frac{1}{2} \times \frac{2}{5} mR^2 \times 64\pi^2$

$\approx 0.028\,J$

$\begin{cases} E_к = \frac{1}{2}mv^2 \\ v = wr \end{cases}$

$\Rightarrow E_к = \frac{1}{2} m w^2 R^2$

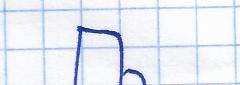
$\approx 0.071\,J$

$E_{пол} = \Delta E_к + E_{вр}$

$= 0.028 + 0.071$

$= 0.099$

$\approx 0.1\,J$

7. 

$h = 3m$

$m = 10кг$

Найти v и L

момент инерции:

$J = \frac{mh^2}{3}$

$\begin{cases} \frac{mgh}{2} = \frac{Jw^2}{2} \\ v = wh \end{cases} \Rightarrow \begin{cases} w = \sqrt{\frac{mgh}{J}} \\ v = \sqrt{\frac{mgh^3}{J}} \end{cases}$

$v = \sqrt{\frac{10 \times 9.8 \times 2.7}{\frac{10 \times 9}{3}}} \approx 9.4\,м/с$ ~~$9.4\,м/с$~~ $9.39\,м/с$

$L = Iw = Jw$

$= \frac{mh^2}{3} \times \sqrt{\frac{mgh}{\frac{mh^2}{3}}}$

$= \sqrt{mgh \times \frac{mh^2}{3}} \approx 47.0\,кгм^2/с$