HW 9-14 Soln)

Use conservation of angular momentum, $L_i = L_f$.

$$I_i\omega_i = I_f\omega_f$$

The ratio of the kinetic energies is

$$\frac{K_f}{K_i} = \frac{\frac{1}{2}I_f\omega_f^2}{\frac{1}{2}I_i\omega_i^2} = \frac{(I_f\omega_f)\omega_f}{(I_i\omega_i)\omega_i} = \frac{\omega_f}{\omega_i} = \frac{6}{2} = 3$$

This extra energy come from the work the professor does pulling in his arms.