
Example

An exercise machine is designed to dissipate the energy of the user by employing a device like the one in the figure. The tension in the rope and the friction between the rope and notched wheel result in a constant average force of 25.1 lbf being applied to the wheel. The wheel has a 5" radius and turns at 120 rpm.

Find the maximum increase in internal energy of the wheel for someone exercising under these conditions for one hour.

