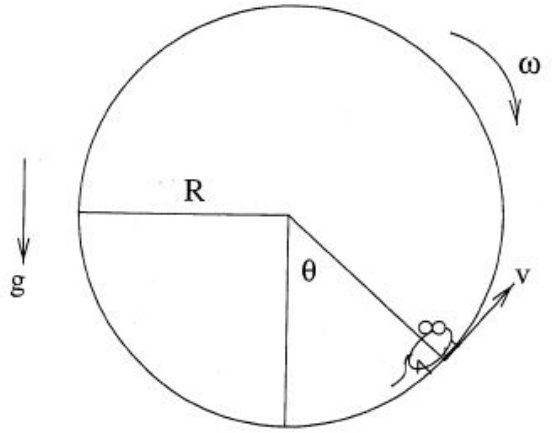
QP33

A mouse of mass m runs in an exercise wheel of mass M and radius R. The mouse runs at constant speed v relative to the wheel. The wheel has a damping torque proportional to its angular velocity given by: $|\tau_{damp}| = k|\omega|$



a) (1 point) If the mouse is not moving relative to the lab, what is the angular velocity ω of the wheel in terms of m, M, R, v and k?

b) (2 points) What is the angle of the mouse, θ?

c) (1 point) How much power is the mouse delivering?