## M98M.1-Mass on a Rope and Cylinder

## Problem

A mass $m$ is lifted by means of a rope drawn across a cylinder as sketched in the figure. The cylinder is fixed so that it does not rotate. A steady horizontal tension $T$ is applied, and the mass rises vertically with no acceleration. Find an expression for $T$ in terms of the coefficient of kinetic friction, $\mu$, between the cylinder and the rope.


