Physics 124 Prelab 3 Week of Feb 6, 2017 - Statics

Purpose: Use the principles of statics to determine an unknown mass

The picture above shows a ladder (of mass $M$, length $L$) standing on a rough surface, leaning against another rough wall, both with coefficient of friction $\mu$. A small mass ($m$) can be hung on the rungs and lifted up step-by-step until the ladder can not support it anymore and slips.

1. Label each of the forces on the diagram (example: $Mg =$ weight of ladder).

2. Assuming the mass is located at the rung associated with the limiting point where the ladder is just about to slip, write down the relationships for the forces that are being exerted on the ladder and the torques.

Equation 1. Sum ($=0$) of forces in the $x$-direction:

Equation 2. Sum ($=0$) of forces in the $y$-direction:

Equation 3. Sum ($=0$) of anti-clockwise moments (torques) about point $A$: 