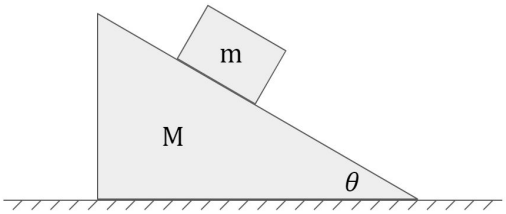
Problem Set 2

January 13, 2020

Problem 1

In the below setup, the incline slides freely and all surfaces are frictionless. Find the acceleration of $\mathbf{M}$, and the vertical and horizontal components of the acceleration of $\mathbf{m}$, $\mathbf{a}_x$ and $\mathbf{a}_y$ respectively.



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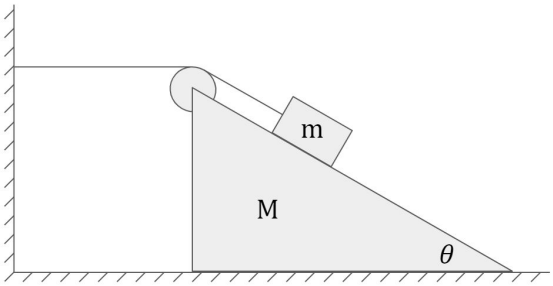

Problem 3

Four identical trapezoidal wooden blocks of mass $\mathbf{m}$ are stacked as shown. Note: before solving each part, reason which parameter(s) the answer should depend on.

a) Find the minimum required coefficient of static friction between the blocks so that the stack is stable.
b) How would your answer change if an object of mass $\mathbf{M}$ was placed on top of the stack?