

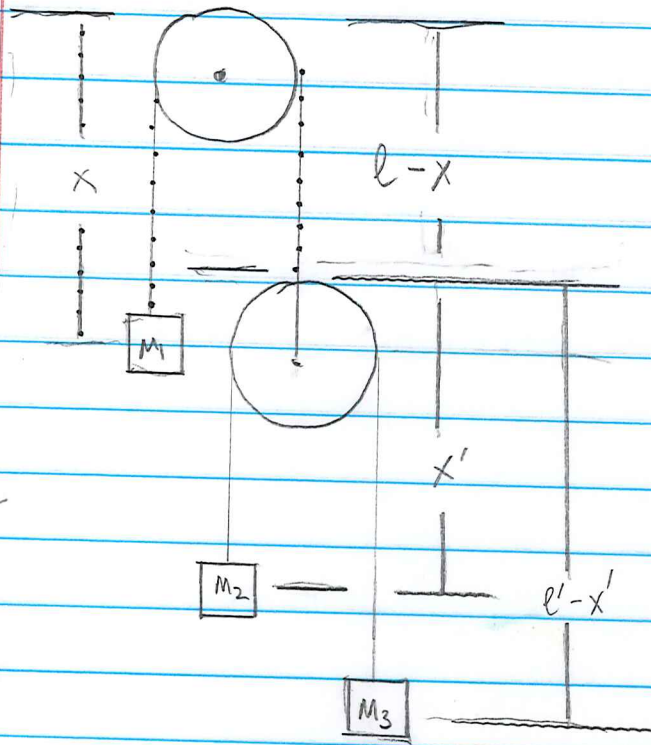
Chapter 7 -

Remark: This one is not difficult, but computationally it is a "holla palooza"!

Double Atwood machine

Consider the system shown in the figure. Here, we have replaced one of the weights in the simple Atwood machine by two weights connected by another cord. The system now has two degrees of freedom.

(entire length of string is " l ")



entire length of string is " l' "

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Let us specify the configuration by the coordinates x and x' , as shown. The masses of the pulleys are neglected for simplicity.

i) Write the number of dof

ii) Write an equation for kinetic energy

iii) Write an equation for potential energy

iv) Write the Lagrangian

v) Write the equations of motion

vi) Write the accelerations, \ddot{x} , and \ddot{x}'