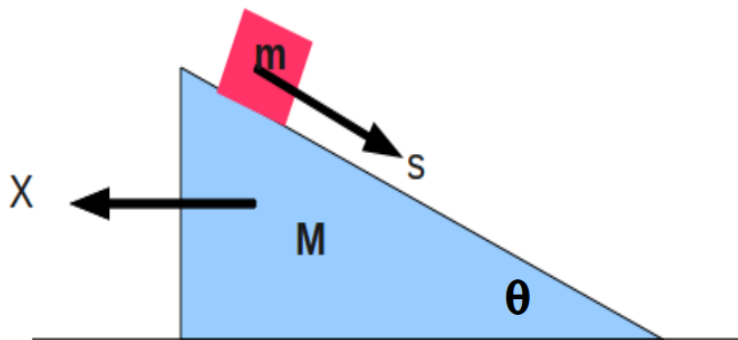


## PHY 711 – Assignment #8

9/19/2016

Continue reading Chapters 3 and 6 in **Fetter and Walecka**.



1. The figure above shows a box of mass  $m$  sliding on the frictionless surface of an inclined plane (angle  $\theta$ ). The inclined plane itself has a mass  $M$  and is supported on a horizontal frictionless surface. Write down the Lagrangian for this system in terms of the generalized coordinates  $X$  and  $s$  and the fixed constants of the system ( $\theta$ ,  $m$ ,  $M$ , etc.) and solve for the equations of motion, assuming that the system is initially at rest. (Note that  $X$  and  $s$  represent components of vectors whose directions are related by the angle  $\theta$ .)