

Phys 3610, Fall 2008
Problem Set #5

1. *Taylor*, 7.16
2. *Taylor*, 7.17
3. *Taylor*, 7.31
4. *Taylor*, 7.34
5. *Taylor*, 7.36
6. *Taylor*, 7.37

7. Using the Lagrange equations, find the equations of motion for the double pendulum, shown at the right, where the two degrees of freedom are the two angles ϕ_1 and ϕ_2 . (The lengths of the pendulae are L_1 and L_2 .) The two masses (m_1 and m_2) move in a plane. Don't assume that the angles are small.

What you should produce are two equations (coupled) which are differential equations for $\phi_1(t)$ and $\phi_2(t)$.

Taylor does do this one in the chapter on coupled oscillators but you should derive it for yourself, especially setting up T_2 , which Taylor gets by some clever insight. Do it the usual way but get the same result!

