Physics 105. Mechanics. Professor Dine

Fall, 2005. Homework Set 5. Due Friday., Nov. 4.

All problems are from your textbook.

1. 6-2.
2. 6-7.
3. In a certain problem involving the fate of the universe, it is important to minimize:

$$S = \int_o^\infty dr r^3((\phi'(r))^2 - \alpha U(\phi(r))) \tag{1}$$

   Here U is a function of ϕ whose precise form we do not need to know. Find the equation for ϕ, using Euler's equations. Then return to the expression for the action. By making a change of variables in the integral, can you determine how the action depends on the constant α?

4. 6-18.
5. 7-3.
6. 7-7.