

Homework Assignment #6  
(70 points)Due Thursday, November 21  
(at lecture)

6.1 (10 points) Goldstein 8.16. The Hamiltonian should read

$$H = \frac{p^2}{2a} - bpqe^{-\alpha t} + \frac{1}{2}abq^2e^{-\alpha t}(\alpha + be^{-\alpha t}) + \frac{1}{2}kq^2.$$

6.2 (10 points) Goldstein 8.19

6.3 (10 points) Goldstein 8.20

6.4 (10 points) Goldstein 8.23

6.5 (10 points) Goldstein 8.24. In doing this problem, assume that the cylinder has height  $h$  and that its mass  $\pi a^2 h \rho$  is the same as the mass  $m$  of the mass point. In addition, assume that the helix makes one turn about the cylinder in the cylinder's height  $h$ .

6.6 (10 points) Goldstein 8.9

6.7 (10 points) Challenge problem