# UNIVERSITY OF CALIFORNIA, SANTA BARBARA 

Department of Physics
Physics 105A
Winter 2012
Prof. Gary Horowitz
TA William Kelly

## ASSIGNMENT \#4

Due by Friday, February 3 at 5pm in box on first floor of Broida

1) A solid sphere of radius $R$ and mass $M$ is rotating about an axis through its center with angular velocity $\omega$. What is its angular momentum?
2) Which of the following forces are conservative (where $a, b, c$ are constants)? For those that are, find the corresponding potential energy $U$ and verify that $\vec{F}=-\vec{\nabla} U$.
a) $\vec{F}=\left(a x, b y^{2}, c z^{3}\right)$
b) $\vec{F}=(a x, b x, 0)$
c) $\vec{F}=(a y, a x, 0)$
3) Taylor, problem 4.2
4) Taylor, problem 4.8
5) Taylor, problem 4.28
