UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Department of Physics

Physics 105A Prof. Gary Horowitz Winter 2012 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 ω . 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)
$$\vec{F} = (ax, by^2, cz^3)$$

b) $\vec{F} = (ax, bx, 0)$

- c) $\vec{F} = (ay, ax, 0)$
- 3) Taylor, problem 4.2
- 4) Taylor, problem 4.8
- 5) Taylor, problem 4.28