

PHY 3221 : Intermediate Mechanics, Spring 2003

March 28<sup>th</sup>, 2003

Assignment # 10

(due Friday March 4<sup>th</sup>, 2003, at the beginning of class)

1. Problem 9.2 of Marion and Thornton's book.
2. Problem 9.6 of Marion and Thornton's book.
3. Problem 9.7 of Marion and Thornton's book.
4. Problem 9.10 of Marion and Thornton's book.
5. A long thin rod of length  $l$  and mass  $m$  hangs from a pivot about which is free to swing like a simple pendulum.
  - (a) Calculate the total angular momentum of the rod as a function of its instantaneous angular velocity  $\omega$ . Compare the angular momentum obtained using Eq. (9.23) of your book to that obtained by direct calculation.
  - (b) Calculate the total kinetic energy of the rod as a function of its instantaneous angular velocity  $\omega$ . Compare the kinetic energy obtained using Eq. (9.39) of your book to that obtained by direct calculation.