

PHY820 Homework Set 9

1. [5 pts] Goldstein, Problem 4-21. Be concerned with the effects of uniform local gravity and Coriolis force only. When the ball is dropped from rest, it is dropped while at rest relative to the surface of Earth.
2. [5 pts] Goldstein, Problem 4-23. Hint: You can consider the evolution of angular momentum for the pendulum around a vertical axis.
3. [5 pts] Goldstein, Problem 4-25. In this problem, the angular velocity changes. You need to start out by deriving the effective force in a rotating frame when the angular velocity depends on time. In any natural coordinate system associated with the girl, the force exerted by the girl should have 3 components.
4. [5 pts] Goldstein, Problem 5-3. Note that the tensor of inertia generally *depends on time* in the frame of an observer external to the rotating body.
5. [10 pts] Goldstein, Problem 5-13. You can leave the time proportional to a dimensionless integral.