INDIAN INSTITUTE OF TECHNOLOGY PATNA

PH103 : Physics
Tutorial 8

1. A high speed hydrofoil races across the ocean at the equator at a speed of 200 miles/hour. Let the acceleration of gravity for an observer at rest on the earth be g. Find the fractional change in gravity $\frac{\Delta g}{g}$ measured by a passenger on the hydrofoil due to coriolis force when the hydrofoil heads in the following directions:

   - East
   - West
   - South
   - North

2. A pendulum is rigidly fixed to an axle held by two supports so that it can swing only in a plane perpendicular to the axle. The pendulum consists of a mass M attached to a massless rod of length l. The supports are mounted on a platform which rotates with constant angular velocity Ω. Find the pendulum's frequency assuming that the amplitude is small.
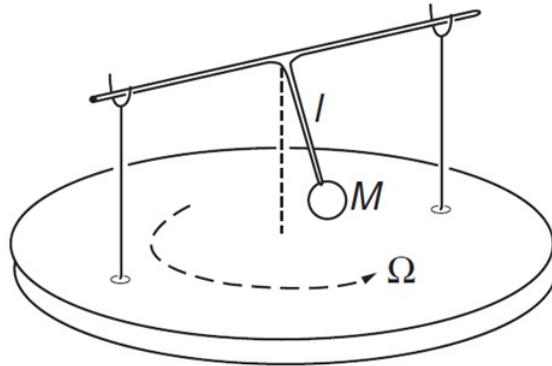

Figure 1: The rotating pendulum