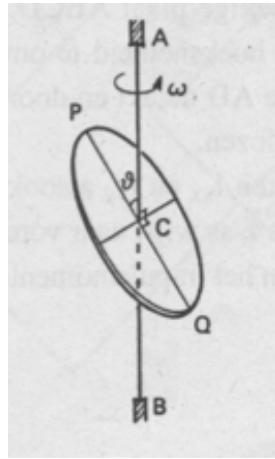# Tutorial 4

Problem 1. A flat, homogeneous, circular disk (mass m, radius R) is connected to an axis through it's center C, such that the axis makes an angle θ $(0 < \theta < \pi)$ with the plane of the disk. The axis rotates with fixed angular velocity ω, and is connected to two bearings in the points A and B.

1. Determine the moment of inertia I_{AB} of the disk with respect to the axis AB.

2. Give the magnitude and direction of the torque $\vec{\tau}$ exerted by the bearings on the axis.

Note: Recall that the moment of inertia $I_\perp$ of the disk with respect to the axis through C and orthogonal to the disk is $I_\perp = \frac{1}{2}mR^2$, and that the moment of inertia I_{PQ} of the disk with respect to the axis PQ is $I_{PQ} = \frac{1}{4}mR^2$.