1. The spinning top shown at the right is on a tabletop. There are two major forces acting on the top. (a)Name these forces. (b)Draw these forces where they act and clearly label them. (c)Describe the torque exerted by each force about the pivot point where the top touches the table. (d)Draw and clearly label the angular momentum vector for the top. (e)Explain why the top will precess and describe the direction of the precession.

2. A 1.00kg bike wheel 60.0cm in diameter is supported at the end of its 40.0cm axle and it precesses at a rate of once every 3.20s in the horizontal plane. Assume all the mass of the wheel is out on the rim. Find (a)its rotational inertia, (b)the torque exerted by gravity, and (c)its rate of spin.

3. In addition to revolving around the sun and rotating about its center, Earth precesses just like all tops that feel torques due to gravity. Earth goes through one complete precession cycle in a period of approximately 25,800 years. Incidentally, this is why Polaris was not the pole star in times past. Anyway, back to the issue at hand. Find the gravitational torque on Earth that would cause this precession and speculate as to its cause.