1) A 20-turn rectangular coil of wire has dimensions 10.0 × 5.0 cm and is hinged on one side (see below). The wire carries a current \( i = 0.10 \, \text{A} \). If \( B = |\vec{B}| = 0.50 \, \text{T} \) and \( \theta = 30^\circ \), what is the torque acting on the coil?

2) A long wire with current 3.34 A is coiled into a 100-turn circle of radius 11.4 cm. The coil lies in the \( x-y \) plane, and the current travels in the counter-clockwise direction (when viewed from the +z axis). Suppose a uniform \( B \)-field of magnitude 10.4 T is directed at an angle 33.5° off of the \( x-y \) plane (into the +z direction).
   a) What is the magnetic dipole moment of the coil?
   b) What is the magnitude of the torque that the \( B \)-field exerts on the coil?
   c) By how much would the energy of the coil change if we rotated it such that \( \vec{\mu} \) and \( \vec{B} \) were perpendicular to one another?