How To Find the Torque on a Current Loop in a Magnetic Field

1. First, find the magnetic dipole moment of the loop. This is $\vec{\mu} = I\vec{A}$, where I is the current and the magnitude of $\vec{A}$ is the area A enclosed by the loop. The direction of $\vec{A}$ is perpendicular to the loop, in the direction given by the "loop RHR": curl your fingers around with the current, and your thumb points in the direction of $\vec{\mu}$.

2. The torque on the dipole is $\vec{\tau} = \vec{\mu} \times \vec{B}$, where $\vec{B}$ is the external magnetic field. The magnitude of this torque is $\mu B \sin\theta$, where θ is the angle between $\vec{B}$ and $\vec{\mu}$ (that's just definition of cross-product).

3. The direction of magnetic torque is given by the RHR for cross-product, or you can just remember that the dipole always wants to line up with the magnitude field. The direction of magnetic torque will be such that will make $\vec{\mu}$ align with $\vec{B}$.