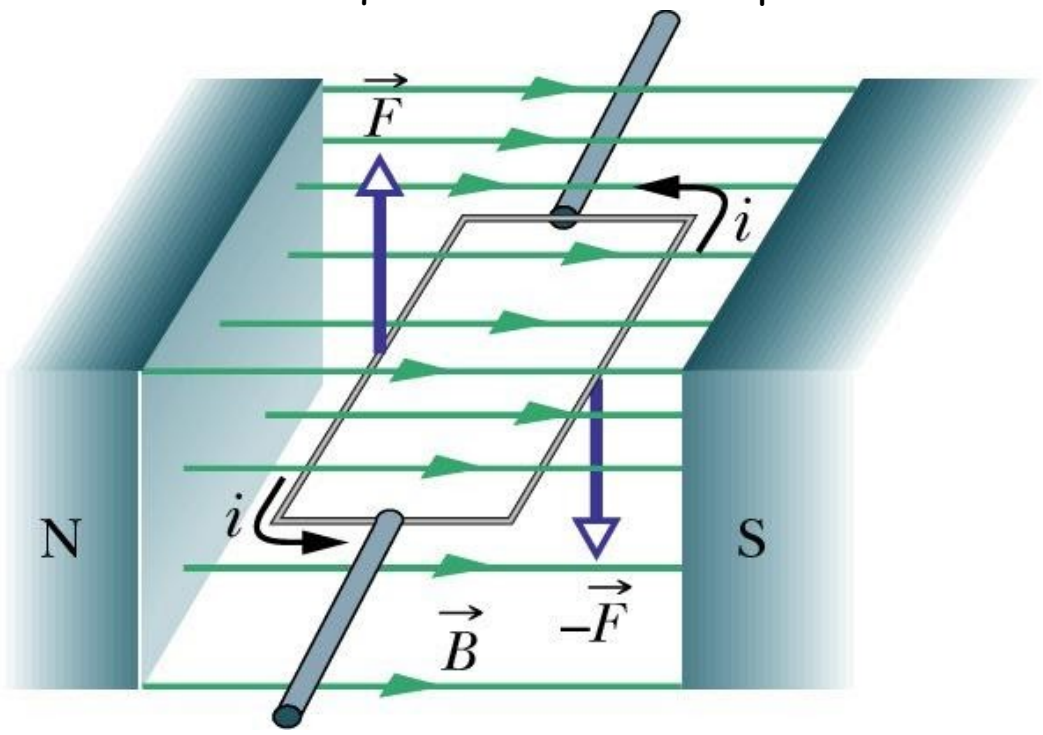
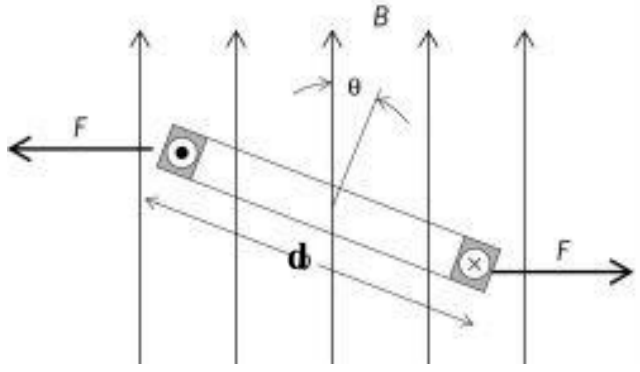
Physics 12 Section 20-9
Torque on a Current Loop



1. Torque is the product of force and distance.

τ = BIl x d, but F (BIl) and d need to be perpendicular



$$\tau = BIl\sin\theta \times \frac{d}{2} + BIl\sin\theta \times \frac{d}{2}$$

The d is twice the lever arm.

And if you have multiple loops then just multiple the above by N (the number of loops)

Example: A circular coil of wire has a diameter of 20.0cm and contains 10 loops. The current in each loop is 3.00A and the coil is placed in a 2.00T magnetic field. Determine the maximum and minimum torque exerted on the coil by the field.

Do# 44 and 46 p. 619