

Charged Particle Moving in Uniform Magnetic Field



- Magnetic field \vec{B} is directed into plane.
- Magnetic force: $\vec{F} = q\vec{v} \times \vec{B}$ (not constant)
- $\vec{F} \perp \vec{v} \Rightarrow \vec{F}$ changes direction of \vec{v} only $\Rightarrow v = v_0$.
- \vec{F} is the centripetal force of motion along circular path.
- Radius: $\frac{mv^2}{r} = qvB \Rightarrow r = \frac{mv}{qB}$
- Angular velocity: $\omega = \frac{v}{r} = \frac{qB}{m}$
- Period: $T = \frac{2\pi}{\omega} = \frac{2\pi m}{qB}$

