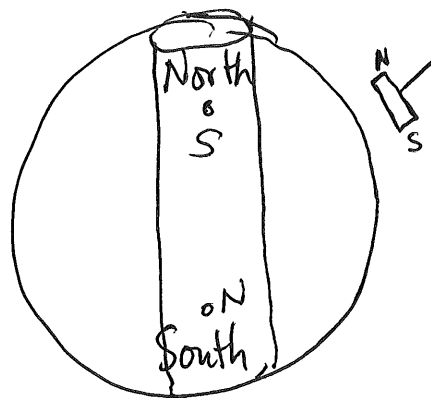
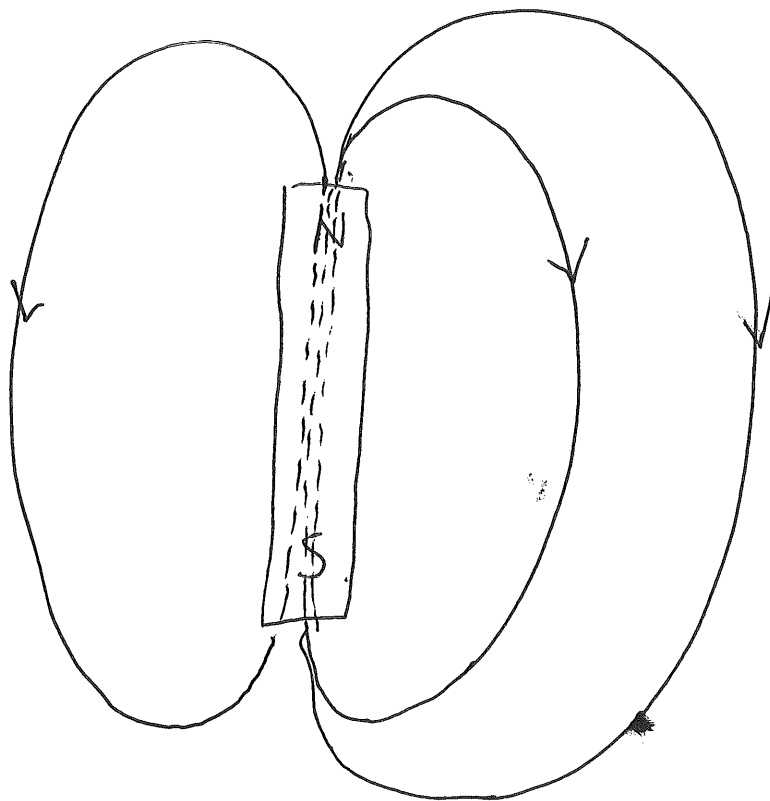
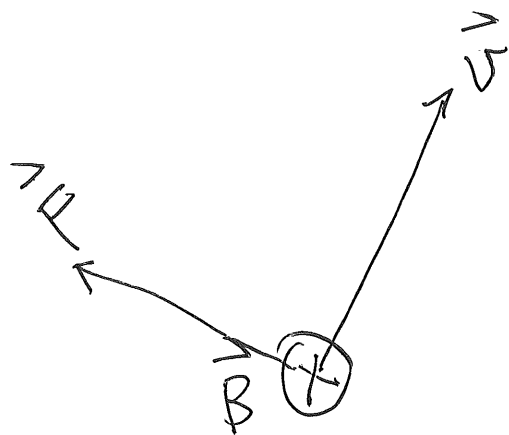
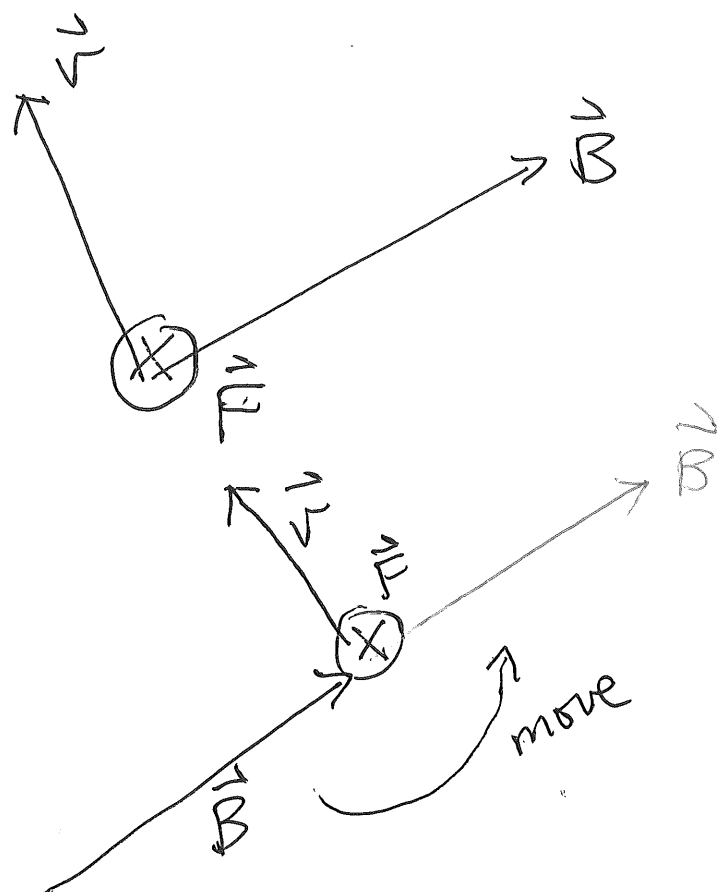
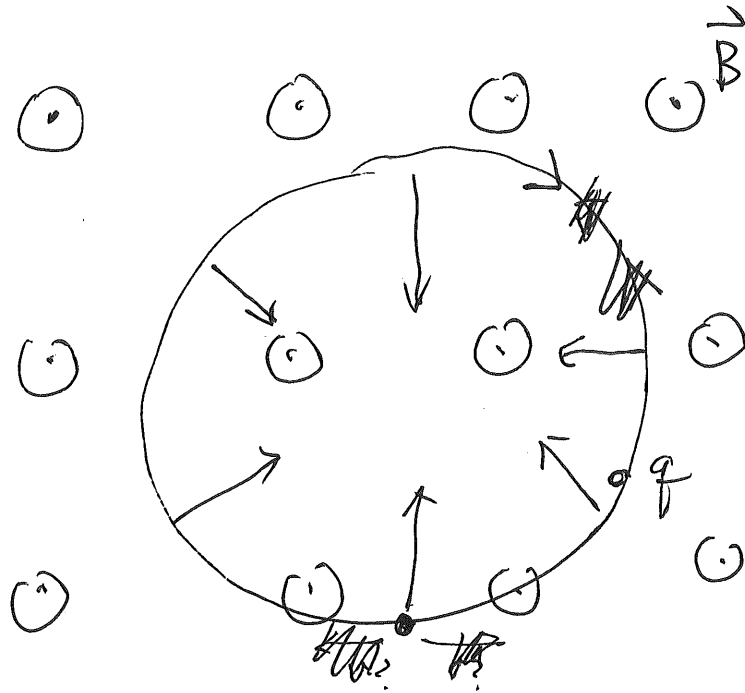




Uniform magnetic field.



$$\vec{F} \perp \vec{v} \Rightarrow \vec{a} \perp \vec{v}$$

$$\vec{B} \text{ is uniform} \Rightarrow |\vec{F}| = \text{constant}$$

$$\Rightarrow |\vec{a}| = \text{constant}$$

$$|\vec{F}| = qvB \sin 90^\circ = qvB$$

$$F = \frac{mv^2}{R} \Rightarrow qvB = \frac{mv^2}{R}$$

$$\Rightarrow v = \frac{qRB}{m}$$

$$T = \frac{2\pi R}{v} = \frac{2\pi R m}{qRB}$$

$$= \frac{2\pi m}{qB}.$$

$$f = \frac{1}{T} = \frac{qB}{2\pi m},$$

$$\omega = 2\pi f = \frac{qB}{m}.$$

↗
Cyclotron frequency. Independent of R and v .