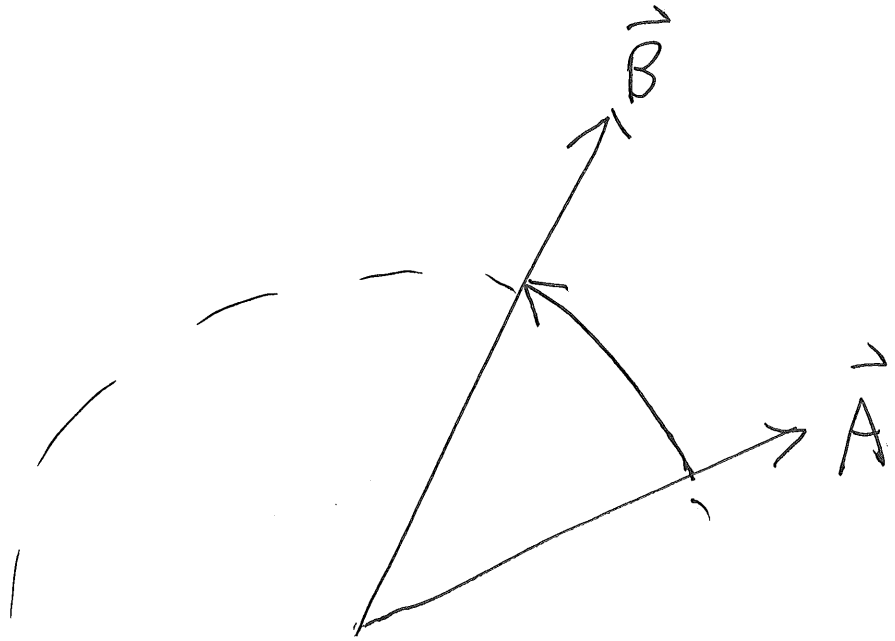
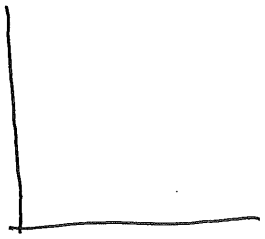
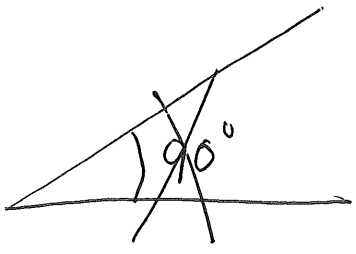

$\vec{B}$
$\vec{A}$




90°

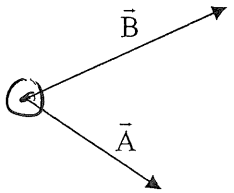
Name: _____

PHY 232 Summer 2016 Class Work

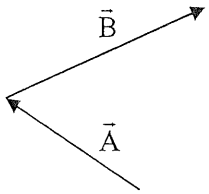
Class 24. Magnetic Force on a Moving Charge

In each of the following cases indicate the direction of $\vec{A}\times\vec{B}$:

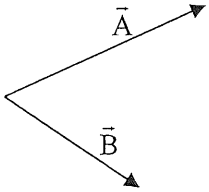
(a)



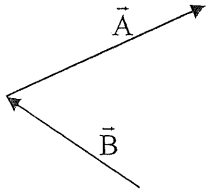
(b)



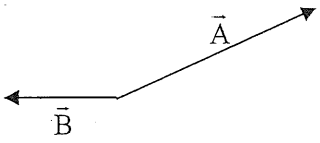
(c)



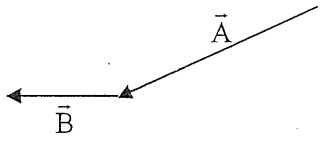
(d)



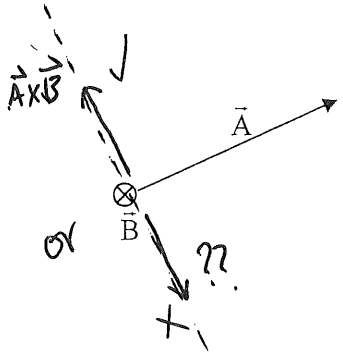
(e)



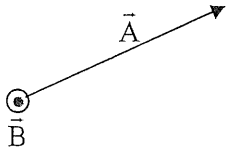
(f)



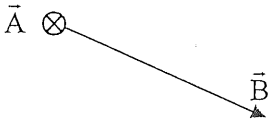
(g)



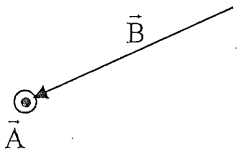
(h)



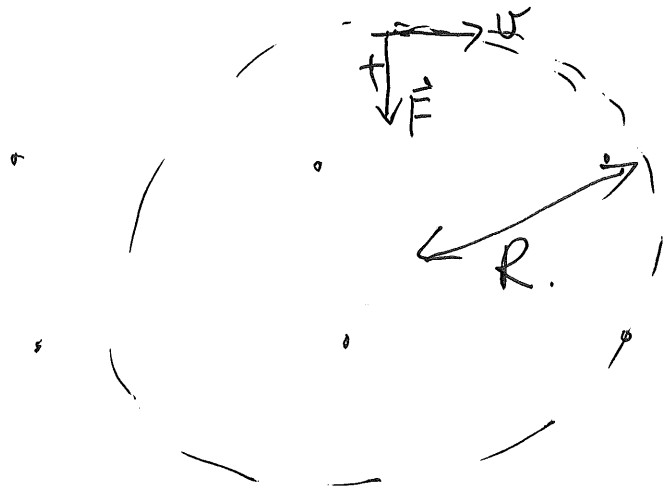
(i)



(j)



$\vec{A} \times \vec{B}$ is always perpendicular to the plane formed by $\vec{A}$ and $\vec{B}$.



$$qvB = m\frac{v^2}{R} \Rightarrow v = \frac{qRB}{m}$$

$$\Rightarrow \omega = \frac{v}{R} = \frac{qB}{m}$$

For periodic motion: (also waves).

f = frequency = # of cycles / second

T = Period = Time to complete one cycle.

ω = Angular frequency.

= angle (in radians) complete in one second.

$$\boxed{f = \frac{1}{T}}$$

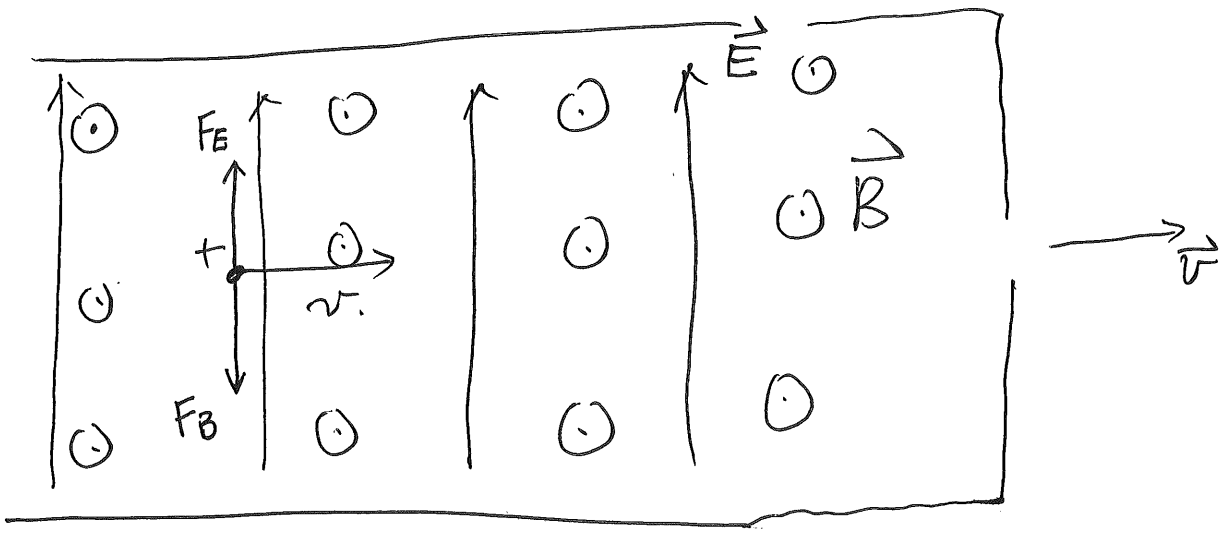
$$\boxed{\omega = 2\pi f}$$

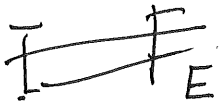
For circular motion:

ω = angular frequency / velocity

For uniform circular motion (constant speed):

$v = R\omega$ $\qquad T = \frac{2\pi R}{v}$ or $T = \frac{2\pi}{\omega}$.





For $a=0$.

$$F_E - F_B = 0.$$

$$qE - qvB = 0.$$

$$\Rightarrow \quad v = \frac{E}{B}.$$

only particle with this velocity can go straight

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