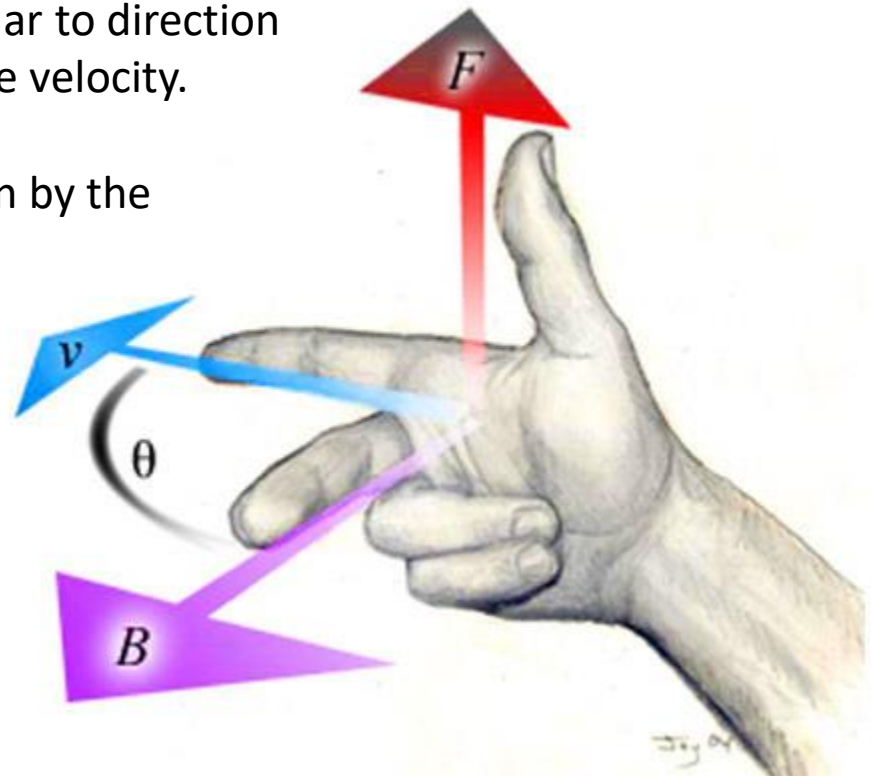# Lorentz Force

Magnetic field **B** acts on a charge **q** moving at velocity **v** with the force known as Lorentz force:

$$F = qvB$$

• Lorentz force is always directed perpendicular to direction of motion and to the magnetic field, and to the velocity.

• Direction of force for positive charge is given by the right hand rule:

Homework

Magnetic field B is directed perpendicular to the plane of the figure, pointing away from you (this is shown by 'dart' symbol ⊗). An electron is moving in the plane with original velocity v, as shown:
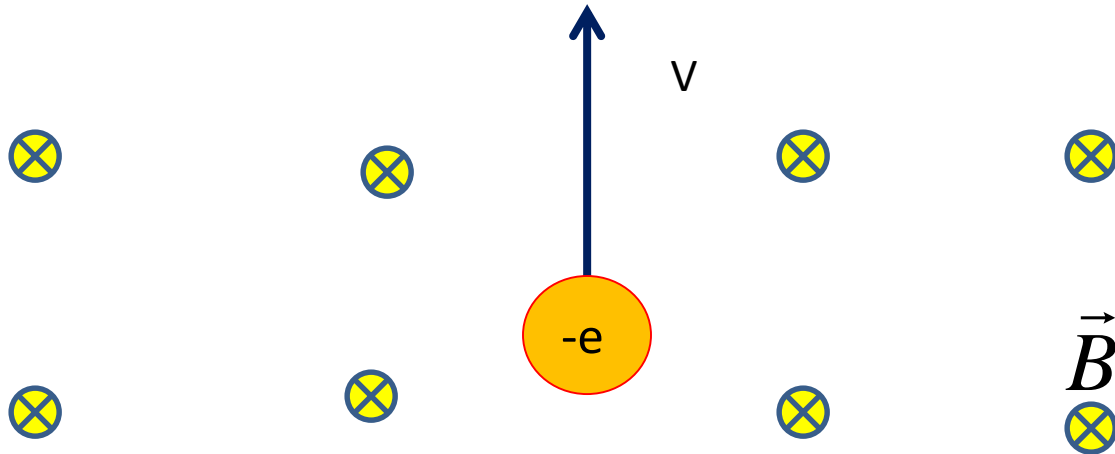
a) Which way the acceleration is originally directed?
b) Will the speed decrease/increase/stay the same in presence of magnetic field?
c) Sketch the trajectory of the electron, including direction of its motion.
d) Find the time after which the electron will return to the starting point.
   For doing this part you will need to refresh your memory about centripetal acceleration.