

5/6

H5 Force on Particle in a Magnetic Field

H5.1 Complete the questions in the table:

Charge /C	Speed /m s <sup>-1</sup>	Angle between velocity & B-field /°	Magnetic Flux Density /T	Force /N
6.0 × 10 <sup>-9</sup>	0.45	90	1.3	(a)
2.0 × 10 <sup>-12</sup>	31	30	0.00056	(b)
2.0 × 10 <sup>-17</sup>	(c)	90	8.4	3.2 × 10 <sup>-15</sup>

- H5.2 Calculate the force on an electron going at  $3.5 \times 10^7 \text{ m s}^{-1}$  in a 3.4 mT magnetic field:
- a) If the electron is travelling perpendicular to the magnetic field.
  - b) If the electron is travelling parallel to the magnetic field.

H5.3 An electron is travelling at right angles to a magnetic field, and at right angles to an electric field such that the electric and magnetic forces cancel out. If the magnetic flux density is 0.043 T and the electric field is 330 kV m<sup>-1</sup>, how fast is the electron going?