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H5 Force on Particle in a Magnetic Field

H5.1 Complete the questions in the table:

| Charge /C | Speed /m s ⁻¹ | Angle between velocity & B-field /° | Magnetic flux density /T | Force /N |
|-----------------------|--------------------------|-------------------------------------|--------------------------|-----------------------|
| 6.0×10^{-9} | 0.45 | 90 | 1.3 | (a) |
| 2.0×10^{-12} | 31 | 30 | 0.000 56 | (b) |
| 2.0×10^{-17} | (c) | 90 | 8.4 | 3.2×10^{-15} |

H5.2 Calculate the force on an electron going at 3.5×10^7 m s⁻¹ in a 3.4 mT magnetic field:

- If the electron is travelling perpendicular to the magnetic field.
- 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⁻¹, how fast is the electron going?