

Solutions

2.1 A Equate magnetic force with mv^2/r to obtain $r = mv/(|q|B)$ for perpendicular motion. A stronger field makes a smaller radius at fixed momentum. Parallel entry gives zero magnetic force in this model.

2.2 $r = mv/(|q|B) = (2 \times 10^{-27} \times 2 \times 10^6) / (1 \times 10^{-19} \times 0.20) = 0.20 \text{ m}$.

2.3 False. A magnetic force can change momentum direction without doing work. Adding an electric field can change the energy, so conclusions about a magnetic field alone do not cover every combined-field apparatus.

2.4 magnetic force. magnetic force means Force due to a magnetic field on a moving charge or current.

3.1 Radius is unchanged; curvature reverses because q changes sign. Magnetic force is perpendicular to velocity and does no work. Oblique entry requires the perpendicular velocity component.