

62. With the \vec{B} pointing “out of the page,” we evaluate the force (using the right-hand rule) at, say, the dot shown on the left edge of the particle’s path, where its velocity is down. If the particle were positively charged, then the force at the dot would be toward the left, which is at odds with the figure (showing it being bent towards the right). Therefore, the particle is negatively charged; it is an electron.

(a) Using Eq. 29-3 (with angle ϕ equal to 90°), we obtain

$$v = \frac{|\vec{F}|}{e|\vec{B}|} = 4.99 \times 10^6 \text{ m/s} .$$

(b) Using either Eq. 29-14 or Eq. 29-16, we find $r = 0.00710 \text{ m}$.

(c) Using Eq. 29-17 (in either its first or last form) readily yields $T = 8.93 \times 10^{-9} \text{ s}$.