

Answer on Question #74046 Physics / Electric Circuits

An electron and a proton, moving with equal velocity, enter a region of uniform, perpendicular magnetic field. Calculate the ratio of the radii of their circular paths in the field.

Solution:

The radius of the circular paths of the charged particle in the magnetic field

$$R = \frac{mv}{qB}$$

Since $q_e = q_p$, $v_e = v_p$ we get

$$\frac{R_p}{R_e} = \frac{m_p}{m_e} = \frac{1.67 \times 10^{-27}}{9.1 \times 10^{-31}} = 1835$$

Answer: 1835 times

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