

Ch. 11 Pwb26

Anti protons

$$v = 5.0 \times 10^7 \text{ m/s}$$

$$r = 2.00 \text{ m}$$

$$m = 1.67 \times 10^{-27} \text{ kg}$$

$$q = 1.6 \times 10^{-19} \text{ C}$$

a) Find the magnetic field strength.

$$qvB = F = ma = \frac{mv^2}{r}$$

$$qvB = \frac{mv^2}{r} \quad \rightarrow \quad B = \frac{mv^2}{rqv} = \frac{mv}{rq}$$

$$B = \frac{(1.67 \times 10^{-27} \text{ kg})(5.0 \times 10^7 \text{ m/s})}{(2.00 \text{ m})(1.6 \times 10^{-19} \text{ C})}$$

$$B = 0.26 \text{ T}$$

b) Is this futuristic magnetic fields?

This value is easily attainable with today's technology.