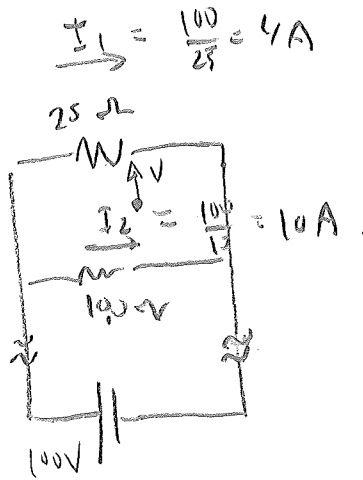


WW13 SOLUTIONS

28.54



$$B_1 = \frac{\mu_0 I}{2\pi r} = 3.2 \times 10^{-5} T \quad (r = 0.025 m)$$

into page

$$B_2 = 8 \times 10^{-5} T \quad \text{out of page}$$

$$B = B_2 - B_1 = 4.8 \times 10^{-5} T \quad \odot$$

$$\vec{F} = q \vec{v} \times \vec{B} \Rightarrow F = (1.6 \times 10^{-18} C) \cdot (650 \times 10^3 \frac{m}{s}) \cdot (4.8 \times 10^{-5} T)$$

$$= 5 \times 10^{-18} N \quad \text{to right. (RHR)}$$

28.62

$$F = \frac{\mu_0 I^2 L}{2\pi x} \quad , \text{ repulsive since antiparallel } I_s$$

$$= 2kx \quad (2 \text{ springs}) \quad \text{solve for } x = \sqrt{\frac{\mu_0 I^2 L}{2\pi k}}$$

28.66

$$d\vec{B} = \frac{\mu_0}{4\pi} I \frac{d\vec{l} \times \hat{r}}{r^2} \quad , \text{ for a semicircle of center}$$

$$B = \frac{\mu_0 I}{4\pi} \frac{\pi r}{r^2} = \frac{\mu_0 I}{4r}$$

In closer semicircle gives bigger B.

$$B_{\text{total}} = \frac{\mu_0 I}{4} \left(\frac{1}{a} - \frac{1}{b} \right) \quad \text{out of page by RHR}$$