
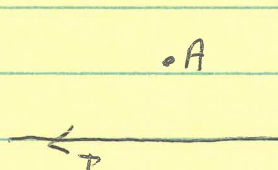


Practice Problems for Chapter 12

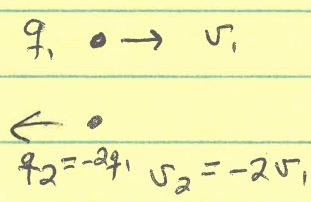
a)  Find the magnitude and direction of B at Point A. The radius is $D/2$.

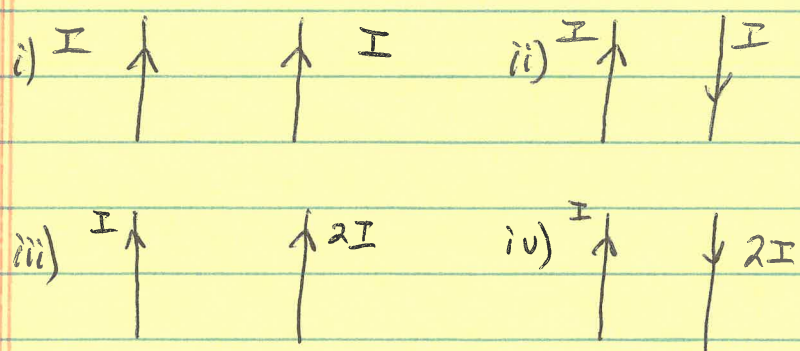
b)  The above wire is cut and laid flat. Find B at Point A if the current is I .

c) Quantitatively compare the B field strength for cases a) and b) above.

Hint: for a current-carrying wire segment of length $2a$, the B field strength a distance x away is

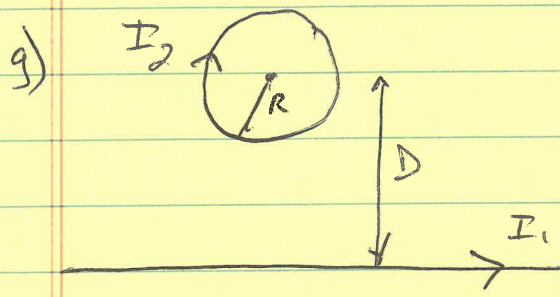
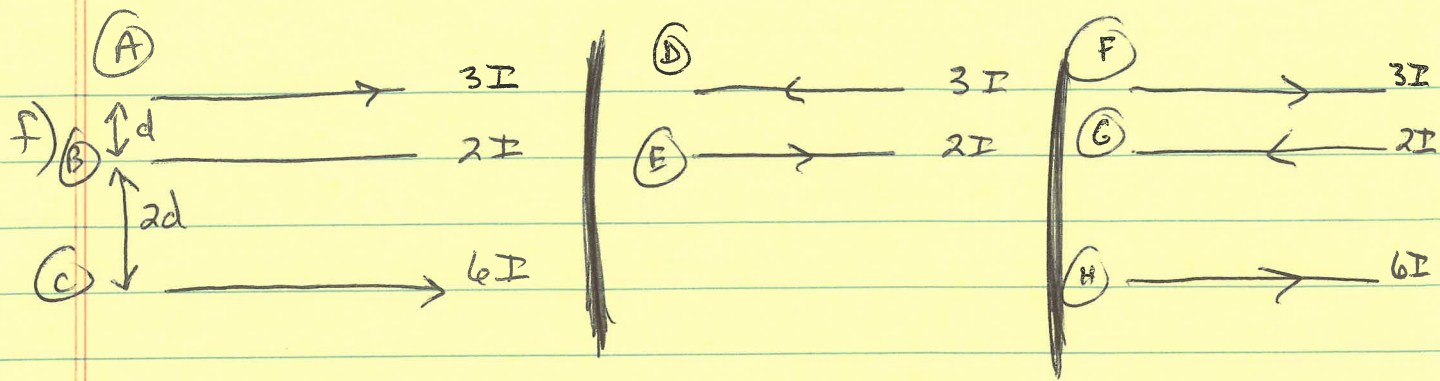
$$B(x) = \frac{\mu_0 I 2a}{4\pi x \sqrt{x^2 + a^2}} \quad (\text{see Eq}^n \text{ 12.7})$$

d) 
 i) How many forces act on charge #1?
 ii) What is the B direction at #1?
 iii) What is \vec{F}_B on #1?

e)  Where is $\vec{B} = 0$ in each case?

i) $I \uparrow \quad \uparrow \quad I$ ii) $I \uparrow \quad \downarrow \quad I$

iii) $I \uparrow \quad \uparrow \quad 2I$ iv) $I \uparrow \quad \downarrow \quad 2I$



What is the magnitude and direction of I_1 , if \vec{B} at the center of the loop is zero?