Keystone - Chapter 21: Patterns of Fields in Space

Here is a large number N of closely packed wires, each carrying a current I out of the page. The width of this sheet of wires is L.



Figure 1: Sheet of current carrying wires.

(a) Show (and explain) the direction of the magnetic field at the two indicated locations, a distance d from the middle wire, where d is much less than L ($d \ll L$). (b) Using the rectangular path shown on the diagram, calculate the magnitude of the magnetic field at the indicated locations, in terms of the given physical quantities N, I, and L. (c) Using your results from part (b), find \vec{B} in the region between two parallel current sheets with equal currents running in opposite directions.

(d) What is \overrightarrow{B} outside both sheets?

This problem is 21.P.26 from M&I vol 2, second edition.