

Problem 4.57 Conducting wires above a conducting plane carry currents I_1 and I_2 in the directions shown in Fig. 4-38 (P4.57). Keeping in mind that the direction

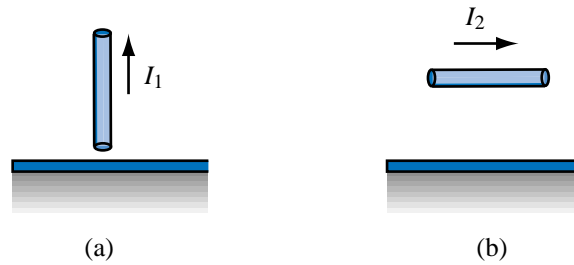


Figure P4.57: Currents above a conducting plane (Problem 4.57).

of a current is defined in terms of the movement of positive charges, what are the directions of the image currents corresponding to I_1 and I_2 ?

Solution:

(a) In the image current, movement of negative charges downward = movement of positive charges upward. Hence, image of I_1 is same as I_1 .

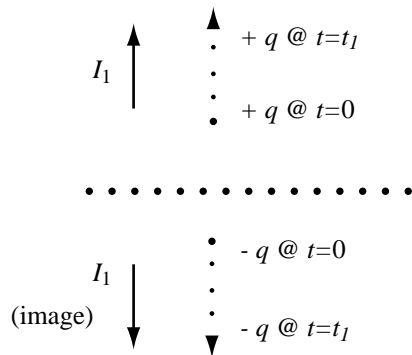


Figure P4.57: (a) Solution for part (a).

(b) In the image current, movement of negative charges to right = movement of positive charges to left.

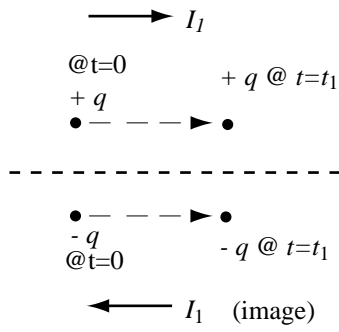


Figure P4.57: (b) Solution for part (b).