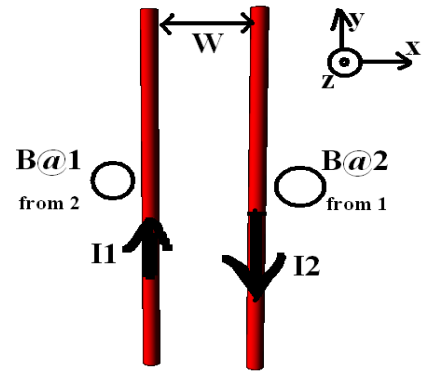


(2) Two long wires each of length L are separated by a distance w carry currents I_1 and I_2 in the directions shown. Note that x and y are in the plane of the wire while z comes out of the page.



(a) In the circles provided, show the direction of the magnetic fields, $B@1$ from 2 and $B@2$ from 1.

(b) Sketch, and label, force on wire 1 (F_1) and the force on wire 2 (F_2) on the diagram.

(c) Showing complete details, calculate the magnitude of the magnetic field at wire 2 (due to the current in wire 1). Your answer is in terms of I_1 , and W .

(d) Calculate the magnitude of the force per unit length on wire 2 in terms of I_1 , I_2 , W and a constant.

(e) Suppose $I_1=1$ A, $I_2=2$ A, and $W=1$ m. Provide a numerical result (with the correct unit vector direction, and correct SI units) for the force per unit length on wire 2.