

Homework Assignment #27

(due Oct. 26, 2020, 11pm, via gradescope)

1. Griffiths 5.9

Hint: For part (b) use the result of Example 5.5 given in the text and in class on Friday, Oct. 23.

2. Griffiths 5.10

Hint: Apply the two step process discussed in class on Oct. 23: Use the \vec{B} field due to the straight infinite wire (Example 5.5 results) and apply this \vec{B} -field at different sections of the loop. Use symmetry where possible.

3. Griffiths 5.13

Hint: Use our result for the force per length, f_{mag} (Eq. (5.40)), on one current, I_2 , due to the \vec{B} -field of a parallel current, I_1 . Replace I with v using Eq. (5.13), and compare with the electric force per length, f_e , on a piece of wire, λdl_2 due to the \vec{E}_1 -field created by another straight long wire (Eq.(2.9)).