7.15

A circuit with a battery with voltage difference ΔV is attached to a resistor, and a steady current flows. The force per charge outside the battery is **E**. The force per charge inside the battery is $\mathbf{f} = \mathbf{f}_{bat} + \mathbf{E}$

How many of the following statements are true?

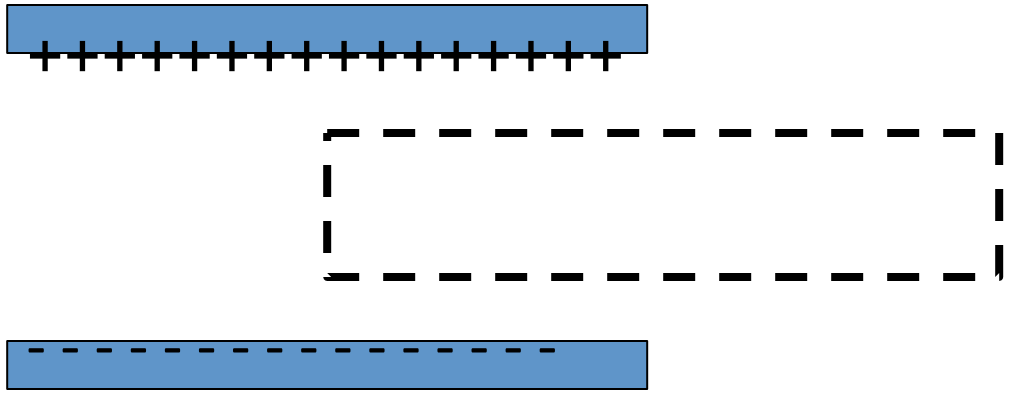
$$\text{emf} = \oint \vec{f} \cdot d\vec{l} \qquad \text{emf} = \oint \vec{f}_{bat} \cdot d\vec{l}$$

$$\text{emf} = \int_{A(\text{inside bat})}^{B} \vec{f}_{bat} \cdot d\vec{l} \qquad \text{emf} = \int_{B}^{A} \vec{E} \cdot d\vec{l}$$

A) 0
B) 1
C) 2
D) 3
E) 4

$$EMF = \oint \vec{f} \cdot d\vec{l}$$

Is there a nonzero EMF around the (dashed) closed loop, which is partway inserted between two charged isolated capacitor plates.



A) EMF=0 here

B) EMF≠0 here

C) ? I would need to do a nontrivial calculation to decide

A loop of wire is near a long straight wire which is carrying a large current I, which is ***decreasing***. The loop and the straight wire are in the same plane and are positioned as shown. The current induced in the loop is

A) counter-clockwise B) clockwise C) zero.