

Name: _____ Section: _____

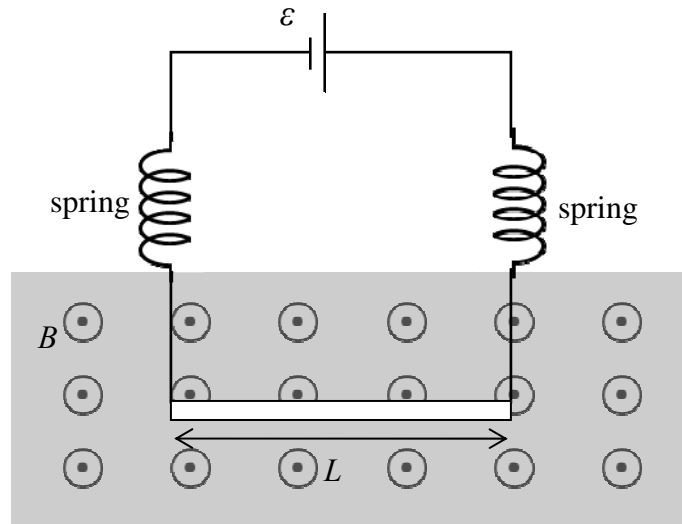
Tuesday, October 27

Quiz 9A

A bar of length L and resistance R is suspended from two springs of spring constant k attached to a battery with emf \mathcal{E} . When a magnetic field B pointing out of the page is turned on in the region of the bar (see figure), the bar moves to a new equilibrium position.

- Which way does the bar move?
- By how much?

(Assume all the wires in the circuit, including the springs, have negligible resistance).

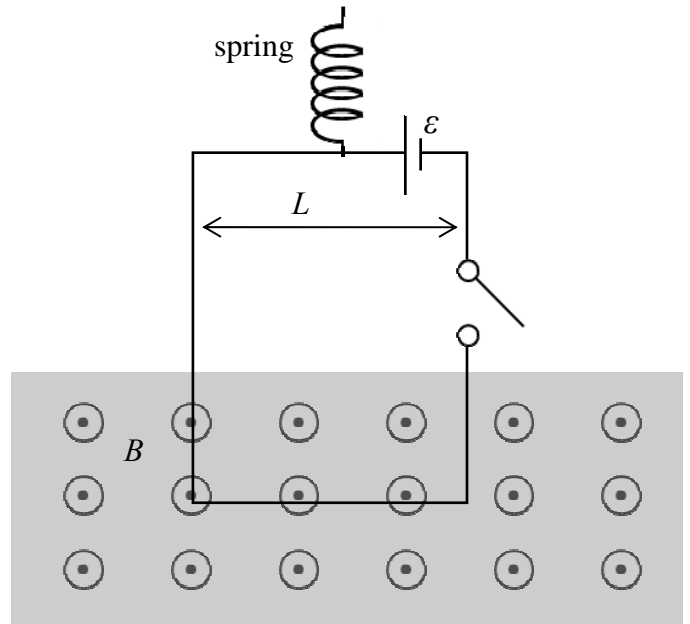


Tuesday, October 27

Quiz 9B

A loop of sides L and $2L$ and total resistance R is partially placed into a region of magnetic field B out of the page (see figure). The switch is initially open. The loop is suspended (through an insulating hook) from a spring of spring constant k . When the switch is closed, the circuit moves and reaches a new equilibrium position.

- Does the spring stretch or is it compressed?
- By how much?



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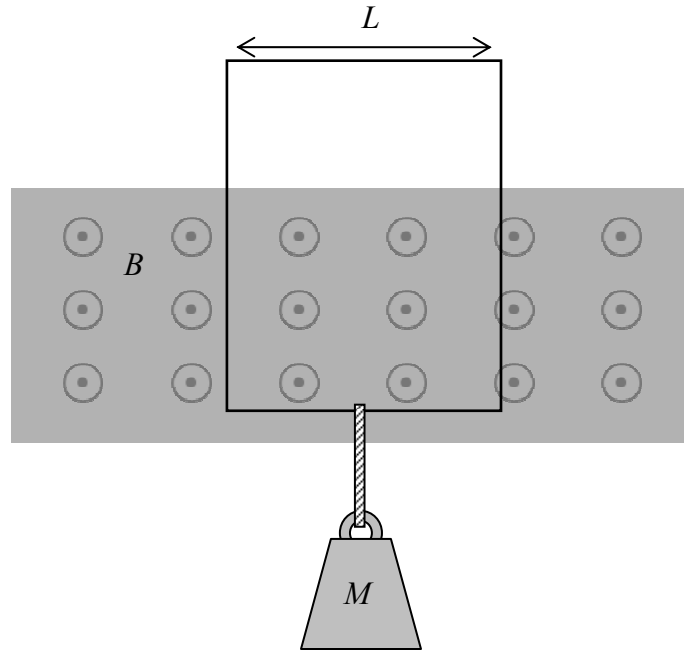
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Quiz 9C

A loop of sides L and $2L$ is partially placed into a region of magnetic field B out of the page (see figure). A current I flows through the loop. When a block of mass M hangs from the lower part of the loop, the system is in equilibrium.

- In which direction does the current flow (CW or CCW)?
- Determine M as a function of B .

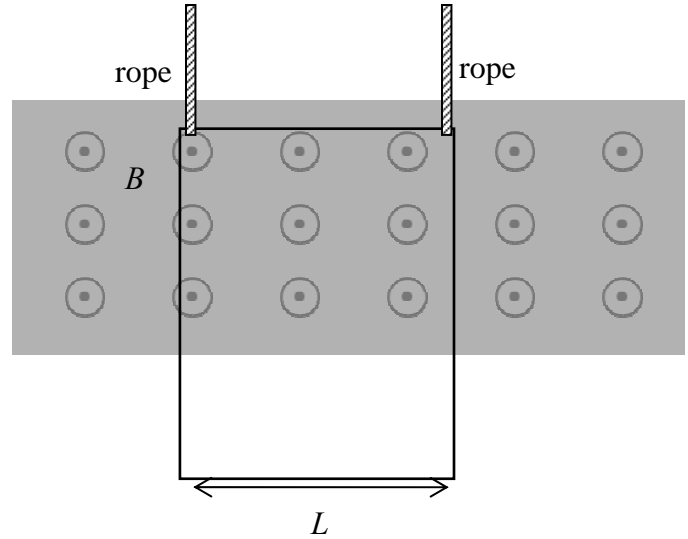
(You may assume that the weight of the circuit is negligible compared to the other forces acting on the system).



Tuesday, October 27

Quiz 9D

A loop of sides L and $2L$ and mass m hangs from two insulating ropes as shown. A current I flows through the loop. The loop is then partially placed into a region of magnetic field B out of the page (see figure). The system is allowed to reach equilibrium.



- a. In which direction must the current flow for the tension in the ropes to be larger than without the magnetic field?
- b. Find the tension increase in each rope in this case.