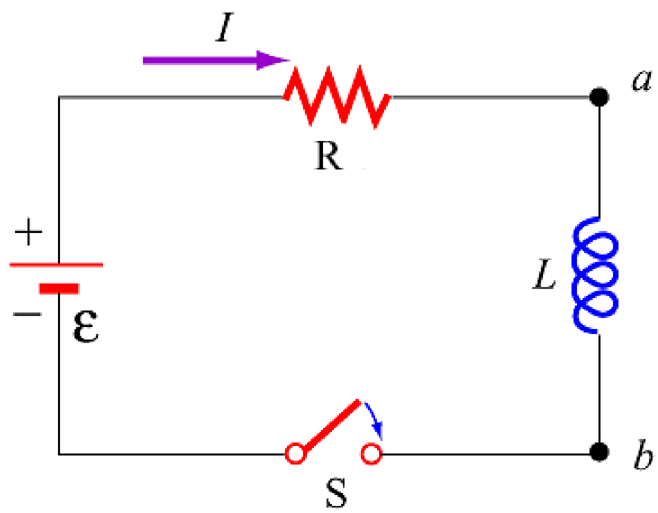
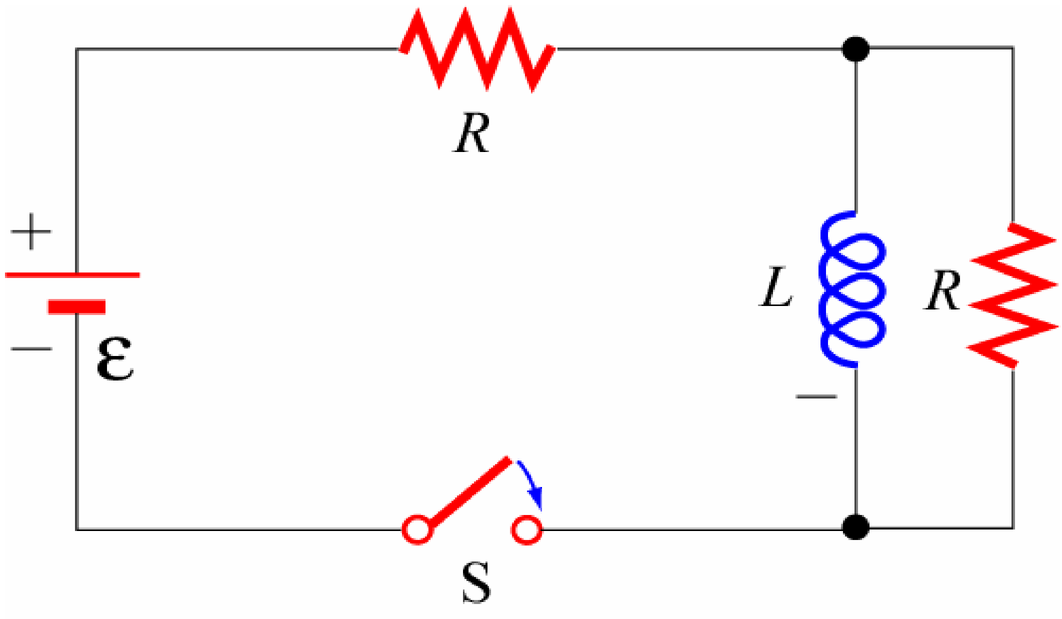


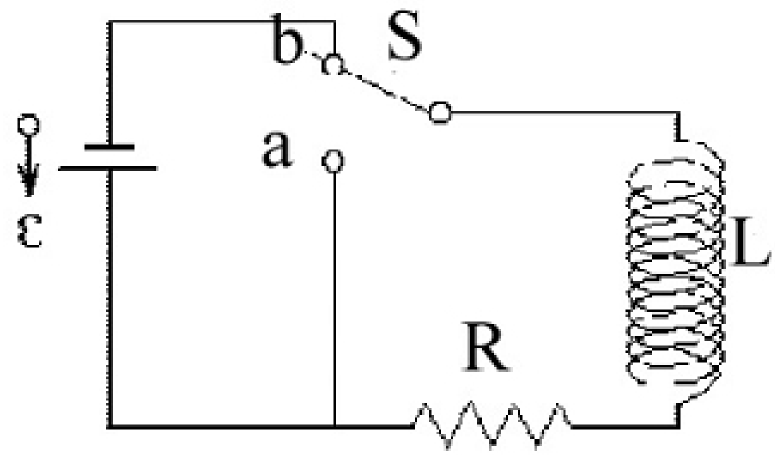
Consider an inductor connected to a battery with emf $\mathcal{E}$ and a resistor *R*. At *t = 0*, the switch is closed. Immediately after the switch is closed the current in the circuit is equal to

1. $\mathcal{E}/R$
2. $2\mathcal{E}/R$
3. Zero
4. Don’t have a clue



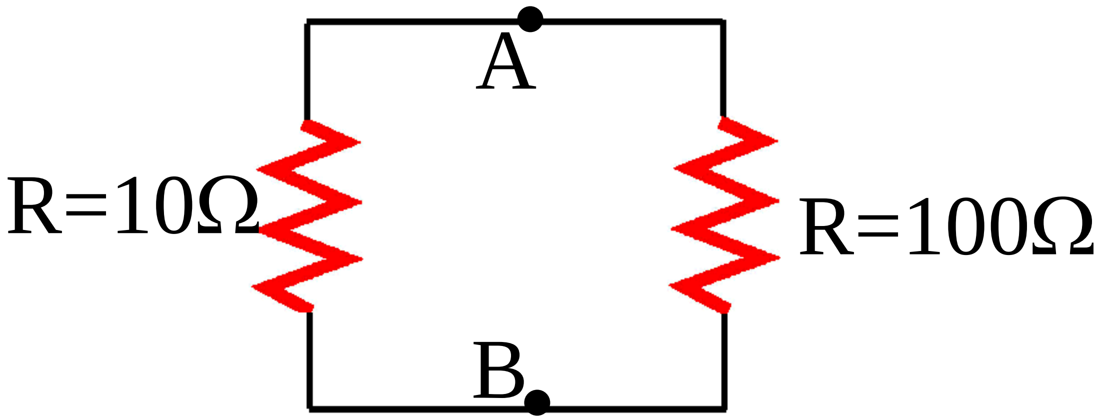
Consider the above circuit, in which the switch S has been closed a very long time. At $t = 0$, the switch is opened. Immediately after the switch is opened the current in the inductor is equal to

1. $\mathcal{E}/R$
2. $\mathcal{E}/2R$
3. Zero
4. Don't have a clue



Consider an inductor connected to a battery with *emf* $\mathcal{E}$ and a resistor *R*. The switch S has been in position *b* for a very long time. At *t = 0*, the switch is thrown to position *a*. The current I through the resistor for *t > 0* is:

1. $\frac{\varepsilon}{R} e^{-Rt/L}$
2. $\frac{\varepsilon}{R}\left(1 - e^{-Rt/L}\right)$
3. **Zero**
4. **Don't have a clue**



A magnetic field B penetrates this circuit outwards, and is increasing at a rate such that a current of 1 A is induced in the circuit (which direction?).

The potential difference V_A-V_B is:

1. +10 V
2. -10 V
3. +100 V
4. -100 V
5. +110 V
6. -110 V
7. +90 V
8. -90 V
9. None of the above

Driving a Motor

Consider a motor (a loop of wire rotating in a B field) which is driven at a constant rate by a battery through a resistor.

Now grab the motor and prevent it from rotating. What happens to the current in the circuit?

1. Increases
2. Decreases
3. Remains the Same