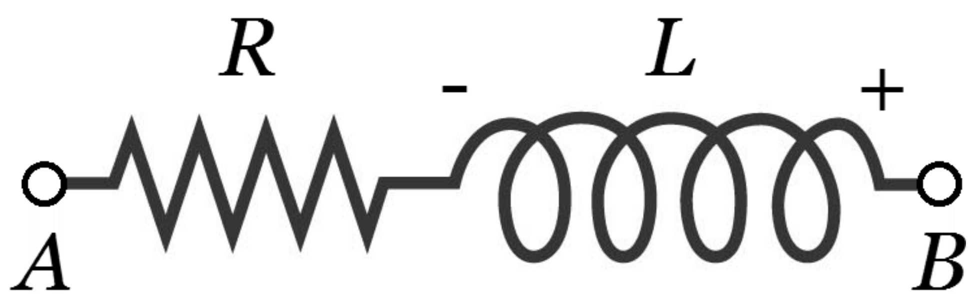
In the circuit segment shown, the inductance is $0.25\,\mathrm{H}$ and the resistance is $50\,\Omega$. The potential difference is

$$\Delta V_{AB} = V_B - V_A = +15\,\mathrm{V}$$

at an instant when the current in the circuit is changing at a rate given by $|dI/dt| = 20\,\mathrm{A/s}$. (The polarity of the inductor at this instant is indicated).

(4pt Q3 XC) Is the inductor supplying or storing energy?

(16pt Q3 FR Replacement) At what rate?



In the circuit segment shown, the inductance is 0.25 H and the resistance is 50 Ω. The potential difference is

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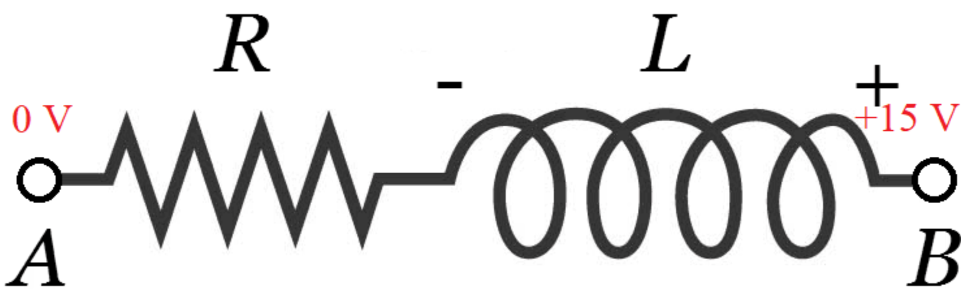

Let $V_A = 0\,\mathrm{V}$ and $V_B = +15\,\mathrm{V}$, so $\Delta V_{AB} = +15\,\mathrm{V}$. The magnitude of the potential across the inductor is

$$\mathcal{E} = -L\frac{dI}{dt} \qquad \Rightarrow \qquad |\mathcal{E}| = L\left|\frac{dI}{dt}\right| = (0.25\,\mathrm{H})\,(20\,\mathrm{A/s}) = 5\,\mathrm{V}$$

In the circuit segment shown, the inductance is 0.25 H and the resistance is 50 Ω. The potential difference is

$$\Delta V_{AB} = V_B - V_A = +15\,\mathrm{V}$$

at an instant when the current in the circuit is changing at a rate given by $|dI/dt| = 20\,\mathrm{A/s}$. (The polarity of the inductor at this instant is indicated).

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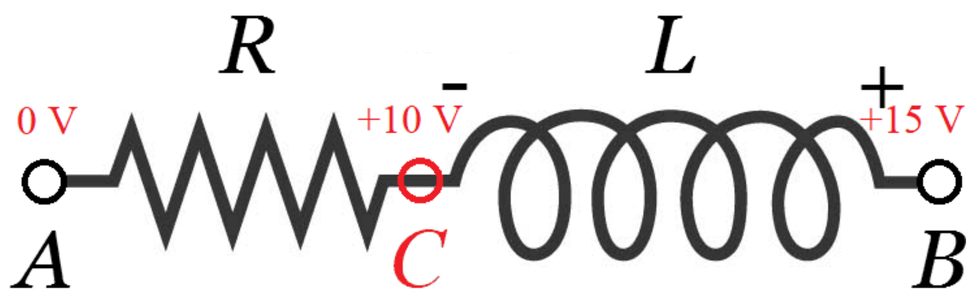

Given the polarity of the inductor, point C must be at 5 V lower potential than point B, so $V_C = +10\,\mathrm{V}$. The potential across the resistor is 10 V, so the current is

$$\Delta V_R = IR \qquad \Rightarrow \qquad I = \frac{\Delta V}{R} = \frac{10\,\mathrm{V}}{50\,\Omega} = 0.2\,\mathrm{A}$$

In the circuit segment shown, the inductance is 0.25 H and the resistance is 50 Ω. The potential difference is

$$\Delta V_{AB} = V_B - V_A = +15\,\mathrm{V}$$

at an instant when the current in the circuit is changing at a rate given by $|dI/dt| = 20\,\mathrm{A/s}$. (The polarity of the inductor at this instant is indicated).

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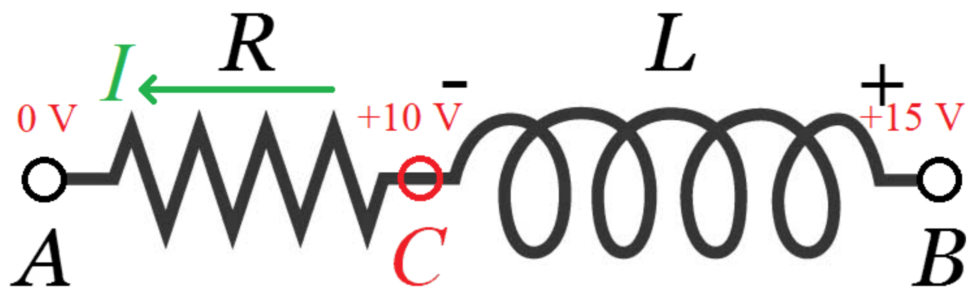

Current flows from high to low potential through a resistor, which is right to left in this resistor. As the resistor and inductor are in series, this same 0.2 A flows right to left through the inductor. That means it flows into the high potential end of the inductor.

In the circuit segment shown, the inductance is $0.25\,\mathrm{H}$ and the resistance is $50\,\Omega$. The potential difference is

$$\Delta V_{AB} = V_B - V_A = +15\,\mathrm{V}$$

at an instant when the current in the circuit is changing at a rate given by $|dI/dt| = 20\,\mathrm{A/s}$. (The polarity of the inductor at this instant is indicated).

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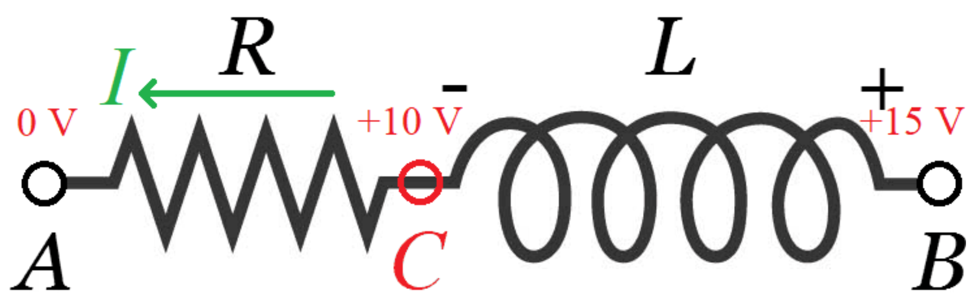

If you "imagine a battery," current flowing in the high potential end would be charging the battery. The inductor is storing energy at a rate (power) of

$$P = I\,\Delta V = (0.2\,\mathrm{A})\,(5\,\mathrm{V}) = 1\,\mathrm{W}$$