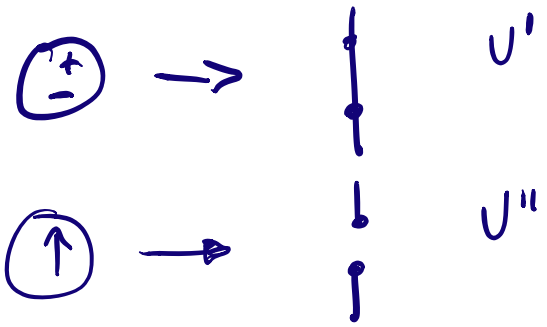
Most important rule of circuits:
practice

Superposition



$V = V' + V''$

Thevenin

Dependent Sources

$i_{sc} = \cdots$

$V_{Th} =$

$V = IR$

$R_{Th} = \frac{V_{Th}}{I_{sc}}$

1st order transient Circuits Pg 262-263

$x(t) = k_1 + k_2 e^{-t/\tau}$

$x(t=0) = k_1 + k_2 e^{-(0)/\tau} = k_1 + k_2$ ($e^{-(0)/\tau} \to 1$)

$$x(t=\infty) = k_1 + k_2 e^{-\infty/\tau} \quad t = 5\tau \approx \infty$$
$$= k_1$$

$$\tau = R_{Th}C$$
$$= \frac{L}{R_{Th}}$$

2) Assume circuit reached steady state BEFORE switch is thrown
"0^-"
- Replace caps with open ← voltage drop
  Replace inductors short ← current thru
  Well use these in the next step

3) Voltage or Current can't change in zero time.
- Replace cap → voltage source
  Replace inductor → current sour

↘ $x(t=0^+)$ ← calculate

4) Long time passed... $t = 5\tau \approx \infty$

- Replace caps → open
  inductors → short

$x(t) = k_1$

5) Form Thevenin Equivalent Circuit

Looking into cap/~~resistor~~

Find R_{Th}

$\tau = R_{Th} C$ or $\tau = \frac{L}{R_{Th}}$ ← make sure your decimal is in the right place

$$x(t) = x(\infty) + [x(0^+) - x(\infty)] e^{-t/\tau}$$