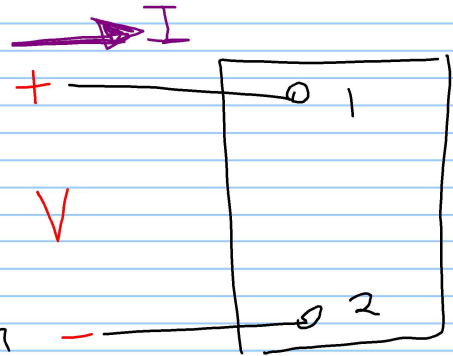


chapter 1

Voltage, Current }
power, Energy }

Passive Sign Convention

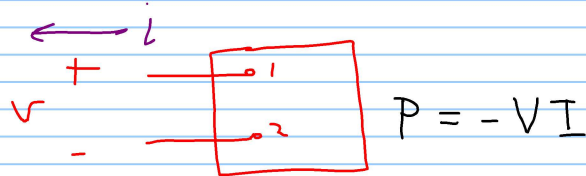
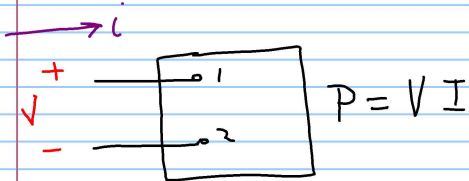
uses a +ve sign in the expression that relates the voltage \times current at the terminals of an element when the reference direction for the current through the element is in the direction of the reference voltage drop across the element

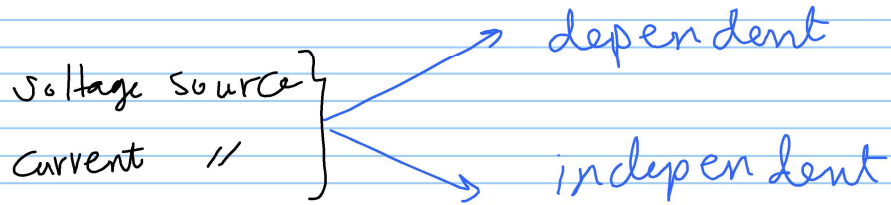


$$\boxed{P = VI} \quad \text{OR} \quad \boxed{P = -VI} \quad \text{Watts}$$

→ if $P > 0$, Power is being delivered to the circuit or circuit component. (element is absorbing power)

→ if $P < 0$, Power is being extracted from the circuit or circuit component. (element is delivering power)

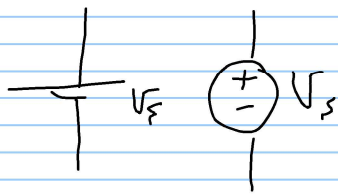


chapter 22.1 Voltage & current sources

→ Independent → its value is not influenced by any other current or voltage in the circuit
 Ideal sources

→ dependent → its value is determined by some other current or voltage in the circuit

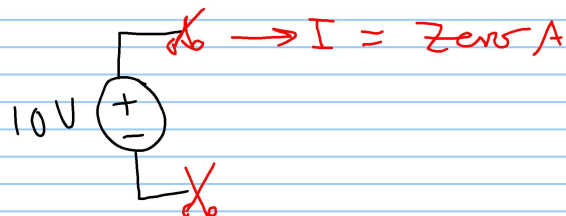
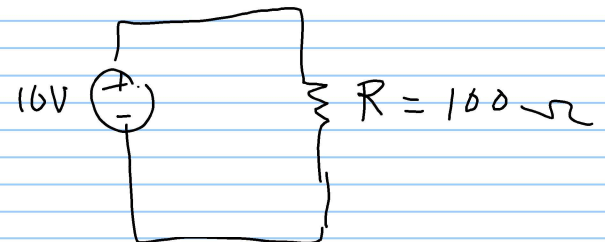
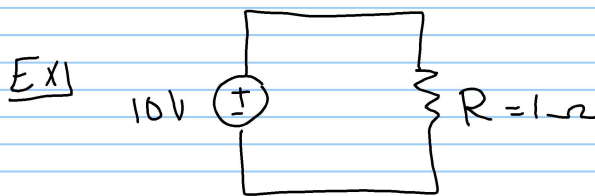
Ideal Voltage Source maintain a prescribed voltage, regardless of the current in the device



Ideal indep. voltage source

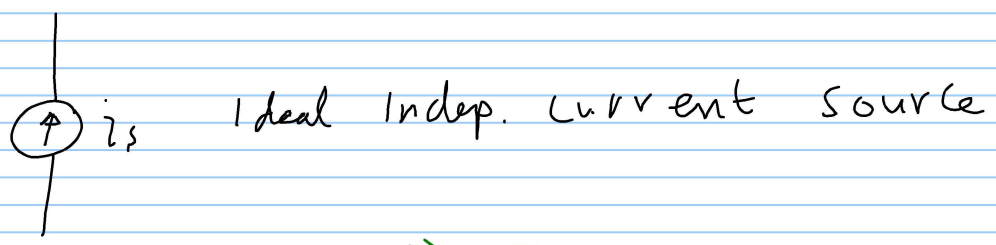
→ $I = \frac{10}{1} A$

→ $I = \frac{10}{100} A$

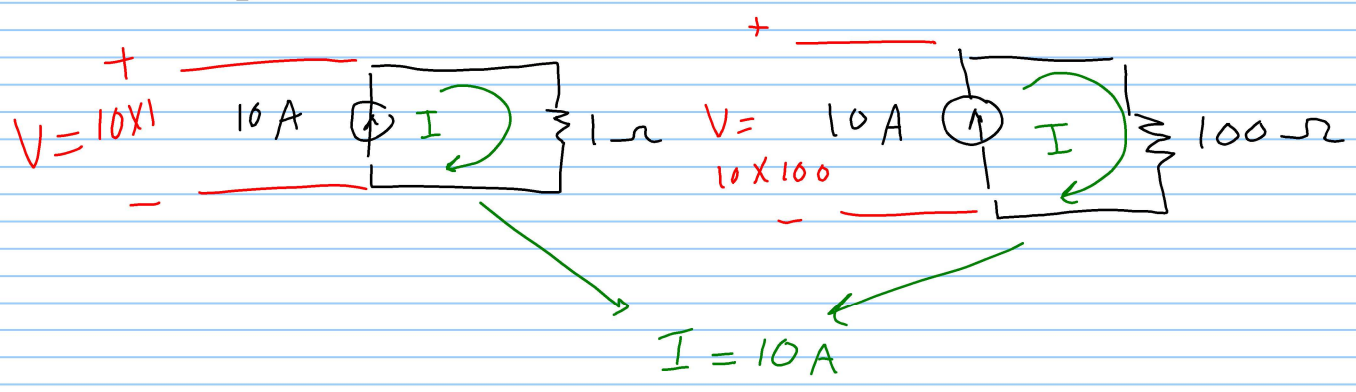


Ideal current source

maintain a prescribed current, regardless of the voltage in the device



EX)



dependent sources

controlled sources



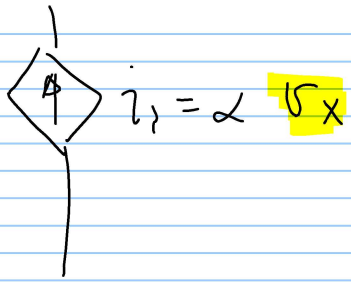
$v_s = \mu v_x$

Ideal dep. voltage-controlled voltage source

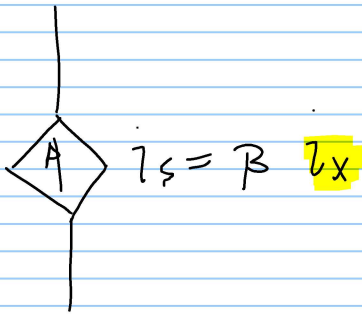


$v_s = \rho i_x$

Ideal dep. current-controlled voltage source



Ideal dep. Voltage - controlled
current source



Ideal dep. Current - controlled
current source