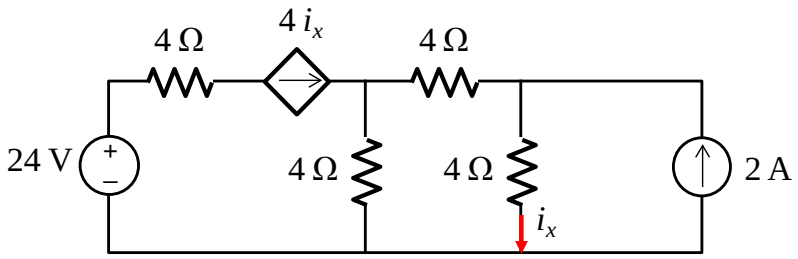
**Circuit Theorem** **Electronic Engineering, Taipei Tech**

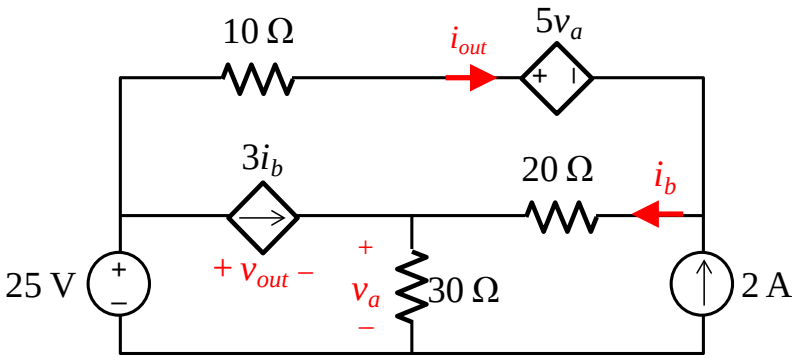
**Midterm (13, Nov. 2018)** **Lecturer: Dr. Yen-Sheng Chen**

**ID:** **Name:**

1. Considering the following circuit,
   (a) (10%) calculate the power of the current-controlled current source;
   (b) (10%) calculate the power of the independent current source.




2. Considering the following circuit,
   (a) (10%) find the output voltage $v_{out}$;
   (b) (10%) calculate the power of the $5v_a$ dependent voltage source.



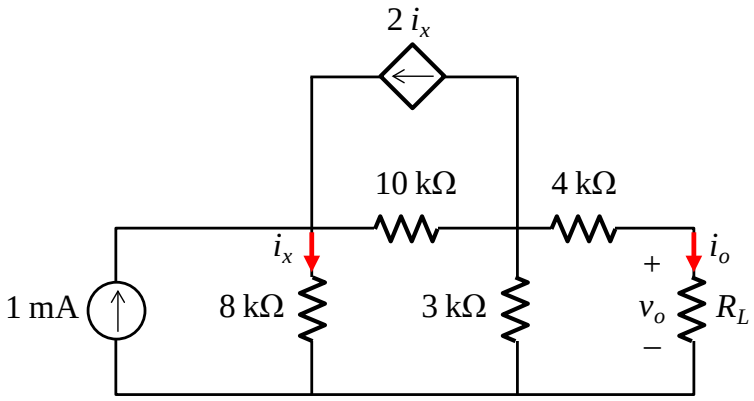
3. A load with a resistance of $R_L$ is connected to the circuit.

(a) (10%) Find the output voltage $v_o$ when $R_L$ = 20 kΩ;

(b) (10%) find the load resistance so that the output current $i_o$ = 100 mA;

(c) (10%) find the power of the load when $R_L$ = 10 kΩ;

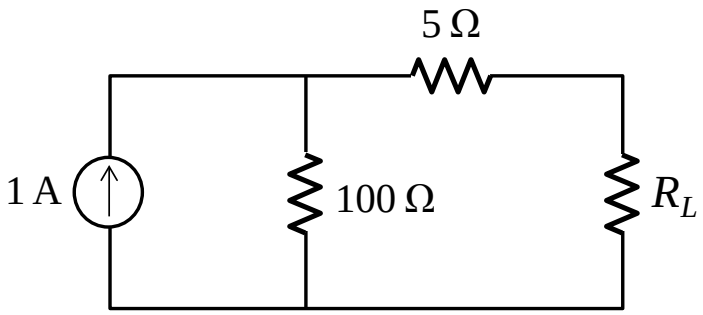
(d) (10%) find the load resistance so that the output power of the load is 80 mW.




4. A load with a resistance of $R_L$ is connected to the circuit.

(a) (10%) Find the value of the variable resistor $R_L$ that will result in maximum power transfer to the load.

(b) (10%) When $R_L$ is adjusted for maximum power transfer, what percentage of the power delivered by the 1-A source reaches $R_L$?




**Please detail the computational process. Failure to do so will result in less or no points at all.**