Name: _____Solution_____ (please print)

Signature: _____

ECE 2201 – Quiz #5
April 22, 2019

Keep this quiz closed and face up until you are told to begin.

1. This quiz is closed book, closed notes. You may use one 8.5" x 11" crib sheet, or its equivalent.
2. Show all work on these pages. Show all work necessary to complete the problem. A solution without the appropriate work shown will receive no credit. A solution which is not given in a reasonable order will lose credit.
3. It is assumed that your work will begin on the same page as the problem statement. If you choose to begin your work on another page, you must indicate this on the page with the problem statement, with a clear indication of where the work can be found. **If your work continues on to another page, indicate clearly where your work can be found. Failure to indicate this clearly will result in a loss of credit.**
4. Show all units in solutions, intermediate results, and figures. Units in the quiz will be included between square brackets.
5. Do not use red ink. Do not use red pencil.
6. You will have 30 minutes to work on this quiz.

_____/20

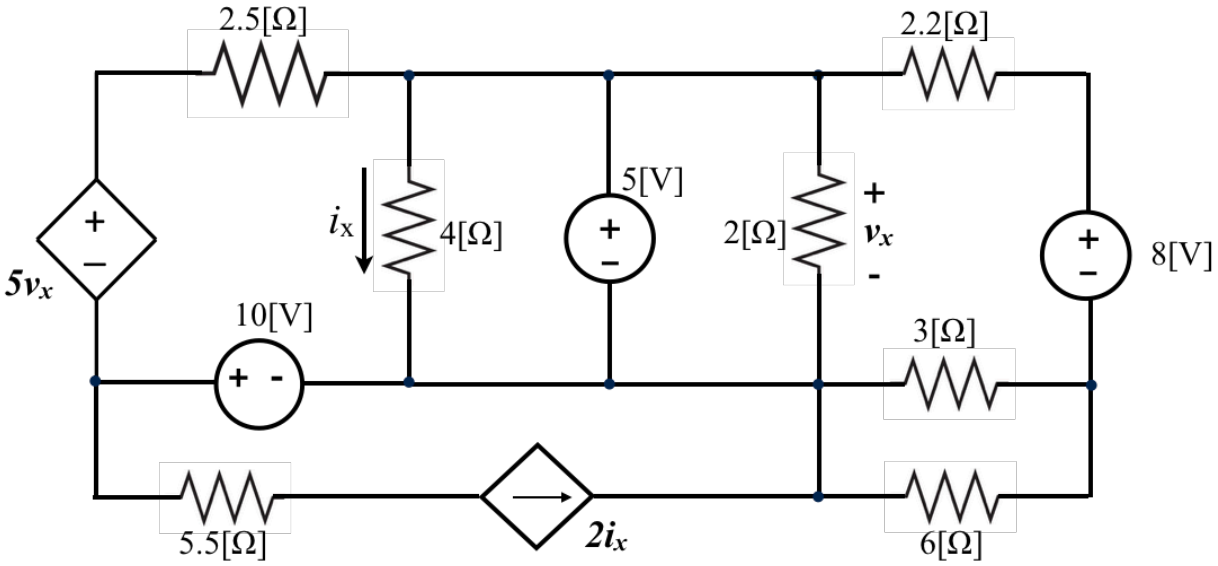
4pm

Room for extra work

4pm

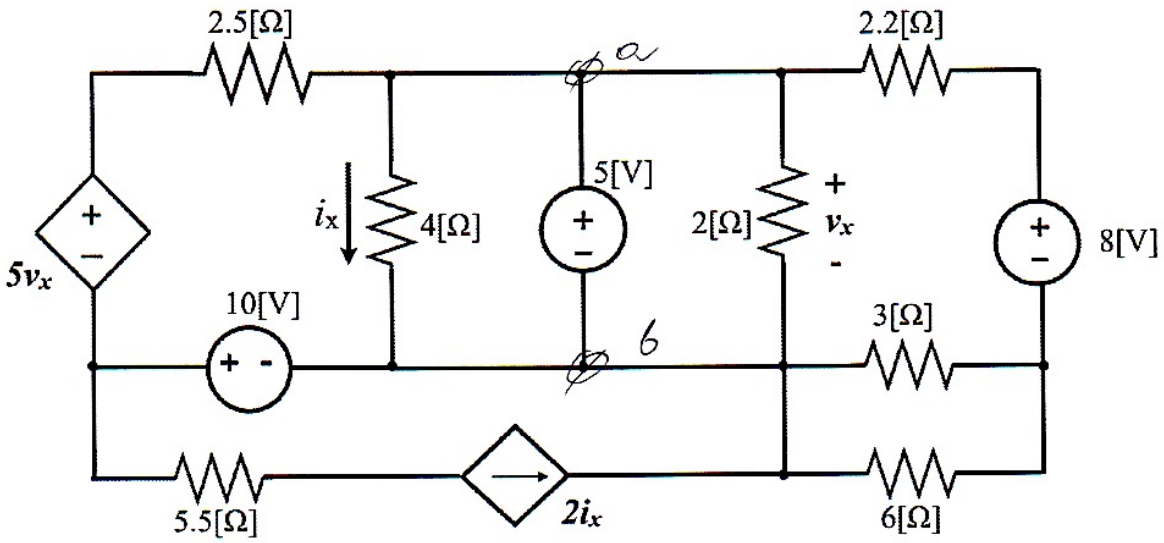
The circuit below has an **independent voltage source** with a value of 5[V].

a) Find the Thevenin equivalent of this circuit as seen by this independent voltage source, 5[V].
b) Draw the Thevenin equivalent, showing numerical values.



The circuit below has an **independent voltage source** with a value of 5[V].

a) Find the Thevenin equivalent of this circuit as seen by this independent voltage source, 5[V].
b) Draw the Thevenin equivalent, showing numerical values.

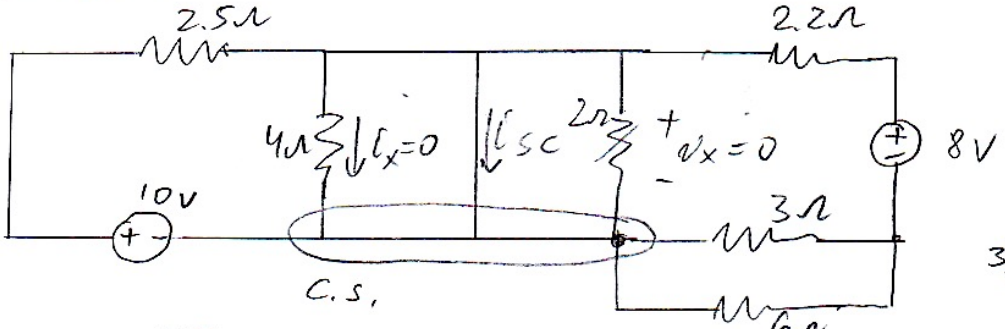


- Disconnect the source 5 [V]
- Find i_{sc} between a/b terminals

$i_x = 0 \rightarrow 2i_x$ source will be deactivated

$v_x = 0 \rightarrow 5v_x$ source will be deactivated = zeroed

redraw:



3[Ω] || 6[Ω] = 2[Ω]

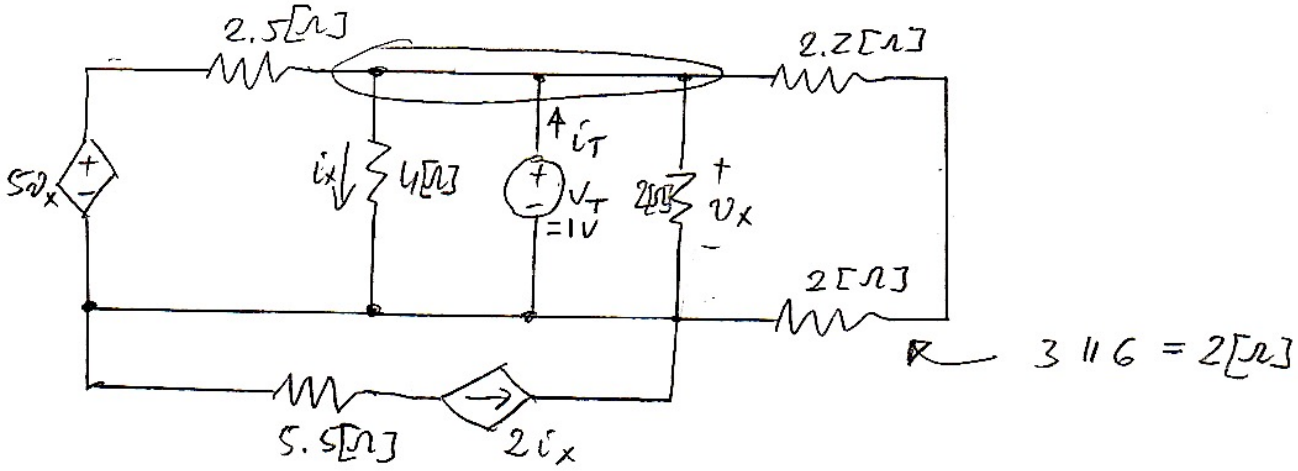
KCL (C.S)

$$\frac{10\ V}{2.5\ \Omega} - i_{sc} + \frac{8\ V}{(2+2.2)\Omega} = 0$$

$$i_{sc} = 5.905\ A$$

Room for extra work

R_{TH} → connect the voltage source after deactivation of independent sources



$i_x = \frac{1V}{4\Omega} = 0.25A \rightarrow 2i_x = 0.5A$

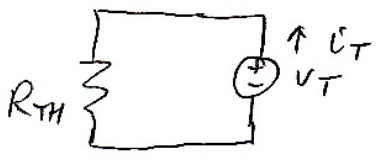
$v_x = 1V \rightarrow 5v_x = 5V$

KCL for i_T

$$\frac{v_T - 5v_x}{2.5\Omega} + \frac{v_T}{4\Omega} - i_T + \frac{v_T}{2\Omega} + \frac{v_T}{4.2\Omega} = 0$$

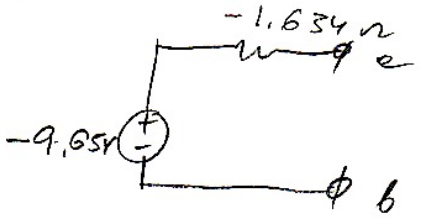
$$i_T = \frac{1-5}{2.5} + \frac{1}{4} + \frac{1}{2} + \frac{1}{4.2} = -0.6119\ A$$

$$R_{TH} = \frac{v_T}{i_T} = \frac{1V}{-0.6119} = -1.634[\Omega]$$



$v_{TH} = i_{sc} \cdot R_{TH} = 5.905A \cdot (-1.634)\Omega$

$= -9.65V$



4pm