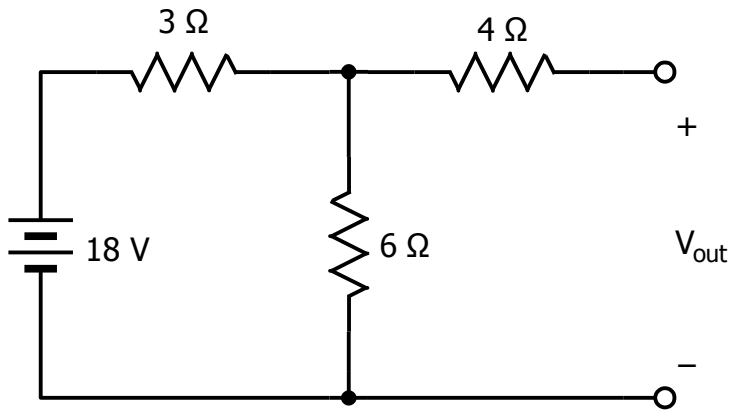
EE3 Fall 2021
Practice Problems 4

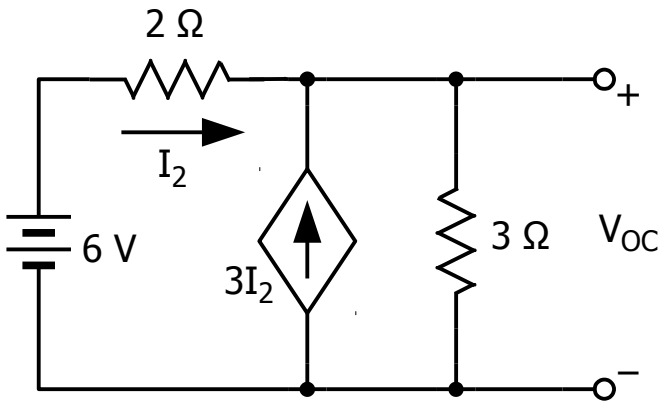
1. Find the Thévenin equivalent circuit for the given circuit, using all three methods discussed in lecture.



$R_{th} = 6\ \Omega$

EE3 Fall 2021
Practice Problems 4

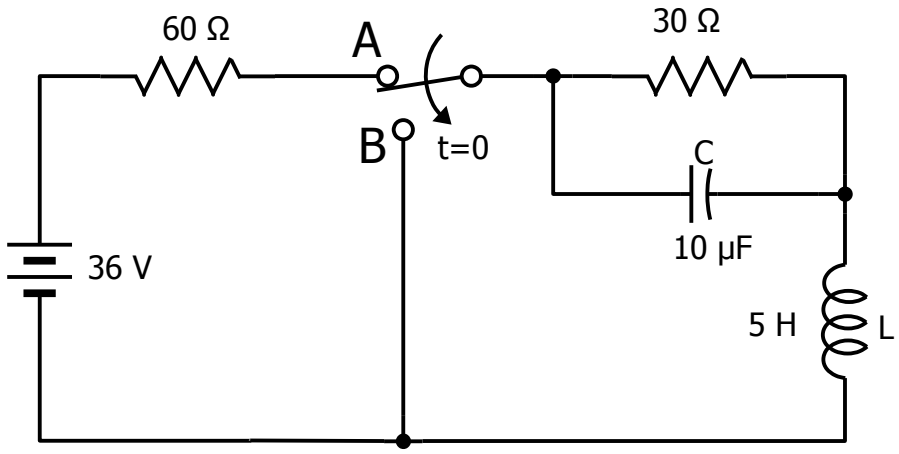
2a. Use Node Voltage Analysis to find $V_{OC.}$
Hint: find an expression for I_2.
2b. Use both allowable methods to find R_{th}.



$R_{th} = 0.43\ \Omega$

EE3 Fall 2021
Practice Problems 4

3. The switch has been in position A for a LONG TIME before switching to position B at t = 0.



a. Find magnitude & direction of $i_L(0^-)$

b. Find magnitude and polarity of $v_C(0^-)$

c. Find magnitude and polarity of $v_L(0^+)$

d. Find magnitude and direction of $i_R(0^+)$

e. Find magnitude and direction of $i_C(0^+)$

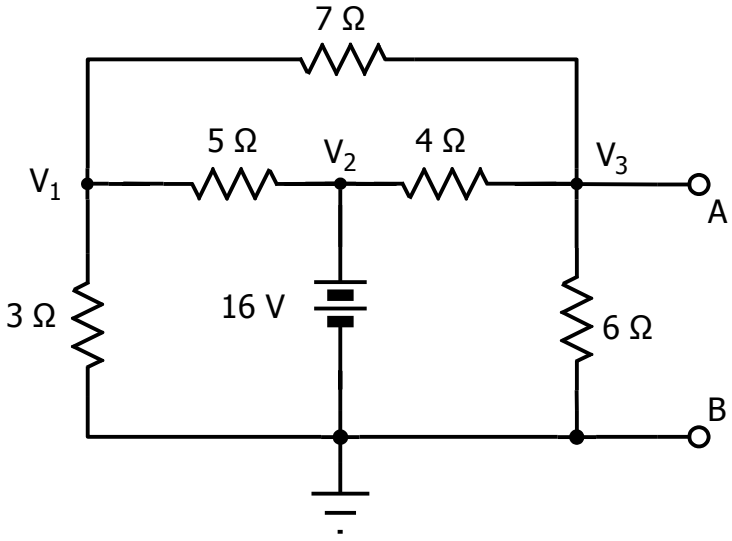
$$i_C(0^+) = 0$$

EE3 Fall 2021
Practice Problems 4

4.

a. Given the V_3 = 8.8 V, use the V_{OC}-I_{SC} method to find the Thévenin Equivalent circuit, looking in through Port A-B.

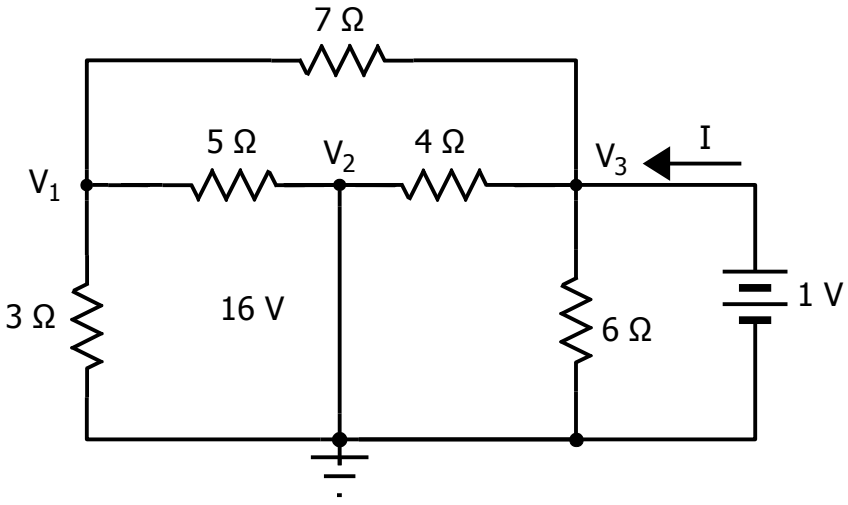
b. Compare your R_{th} to the answer in Problem 5.



$R_{th} = 1.89\ \Omega$

EE3 Fall 2021
Practice Problems 4

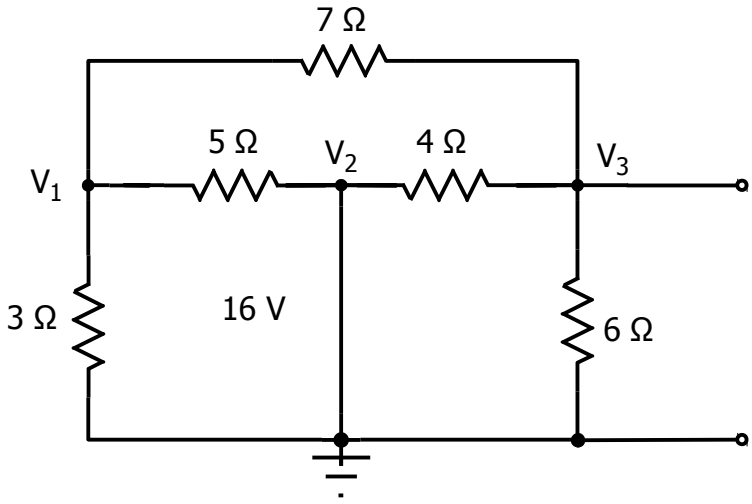
5. This is the circuit that we studied in Problem 4. This time, you will find the Thévenin Equivalent circuit by using Method (b.). V_{oc} does not change. For R_{th}, we replaced the 16 V battery with a short and attached a 1 V battery to the circuit as shown.
   a. Find the current I.
   b. Compute 1 V / I. Units are ohms.
   c. Compare your answer to Problem 4.



$$R_{th} = 1.89\ \Omega$$

EE3 Fall 2021
Practice Problems 4

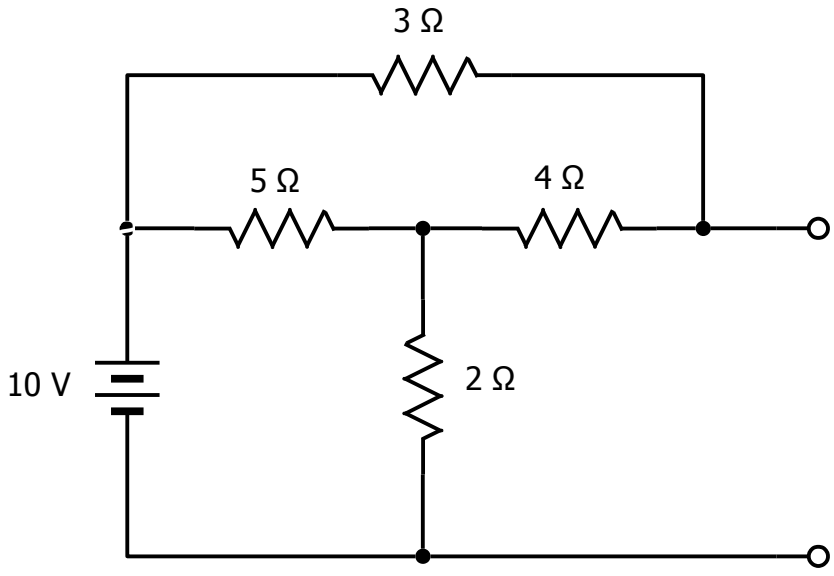
6. This is the circuit that we studied in Problem 1. This time, you will find the Thévenin Equivalent circuit by using Method (c.). We replaced the 16 V battery with a short.
   a. Using your knowledge of series and parallel circuits, find the resistance of the circuit when looking in through the port.
   b. Compare your answer to Problem 4.



$R_{th} = 1.89\ \Omega$

EE3 Fall 2021
Practice Problems 4

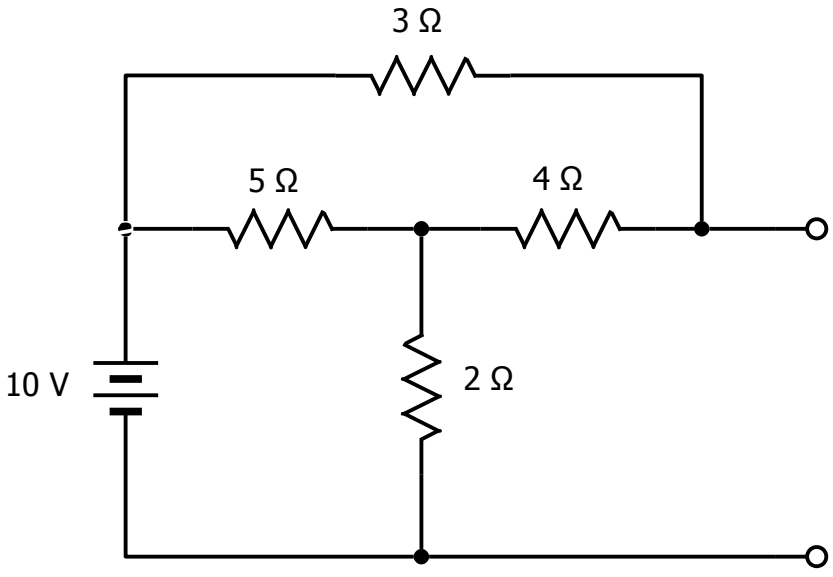
7. Find the Thévenin Equivalent circuit, using Method a.



1.93Ω

EE3 Fall 2021
Practice Problems 4

8. Find the Thévenin Equivalent circuit, using Method c.



1.93Ω