

Name: SOLUTION (please print)

Signature: \_\_\_\_\_

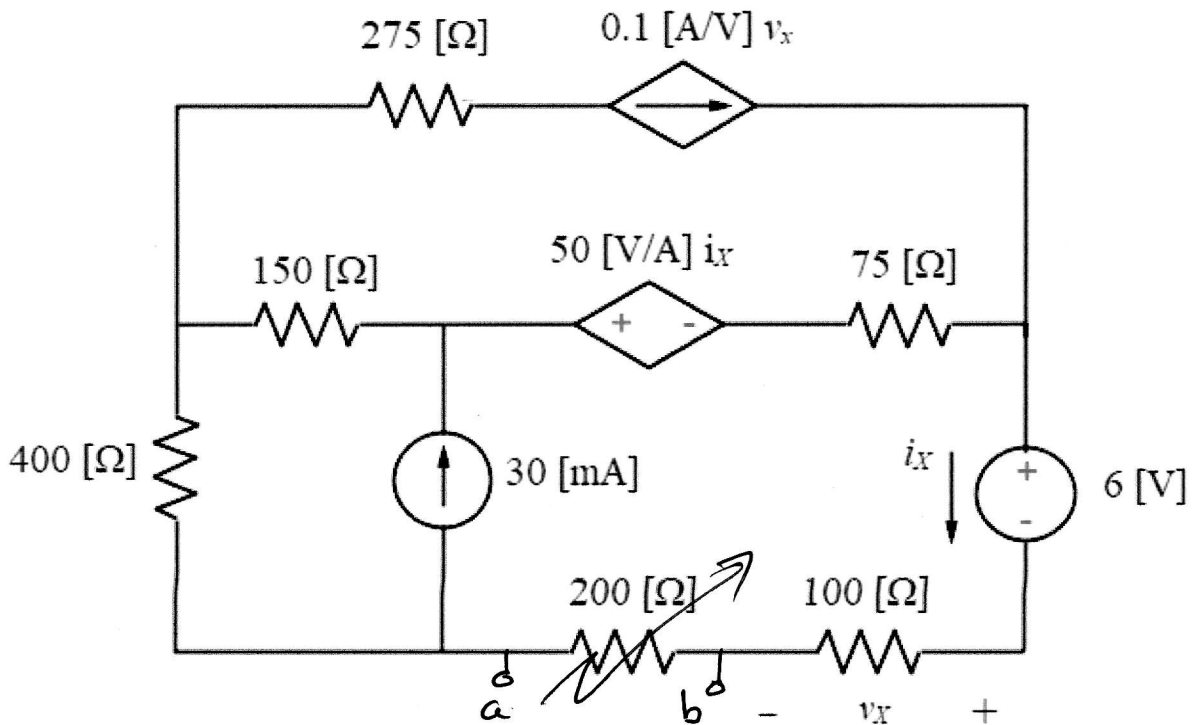
ECE 2202 – Quiz #1  
July 9, 2020

Online

1. This quiz is open book, open notes.
2. 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. Show all units in solutions, intermediate results, and figures. Units in the quiz will be included between square brackets.
4. If the grader has difficulty following your work because it is messy or disorganized, you will lose credit.
5. Do not use red ink. Do not use red pencil.
6. You will have 20 minutes to work on this quiz, and 15 minutes to download/print, scan and submit.

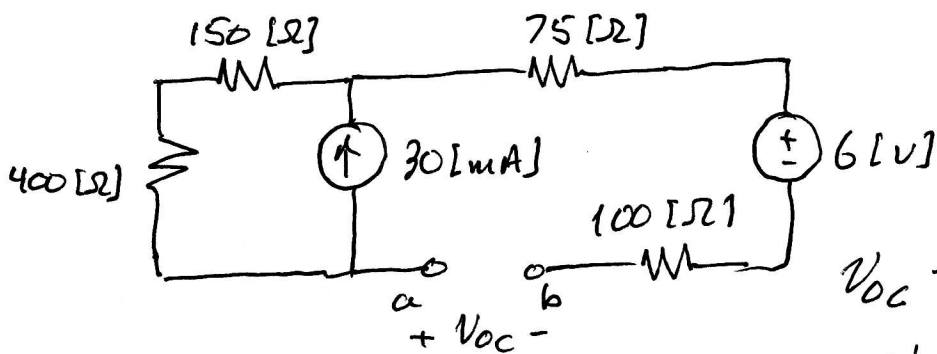
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For the circuit below, find the Thevenin equivalent seen by the 200 [Ω] resistor. Be sure to draw your Thevenin equivalent circuit, with clearly labeled terminals.



Since we want the Thevenin equivalent seen by 200 [Ω], we remove the 200 [Ω] resistor. We need to label the terminals to which it was connected: mine are a, b.

If we find the open-circuit voltage, we will have  $i_x = 0 \Rightarrow v_x = 0$ . This will simplify things considerably.



$$V_{OC} - 6 + 30 \text{ [mA]} (550) = 0$$

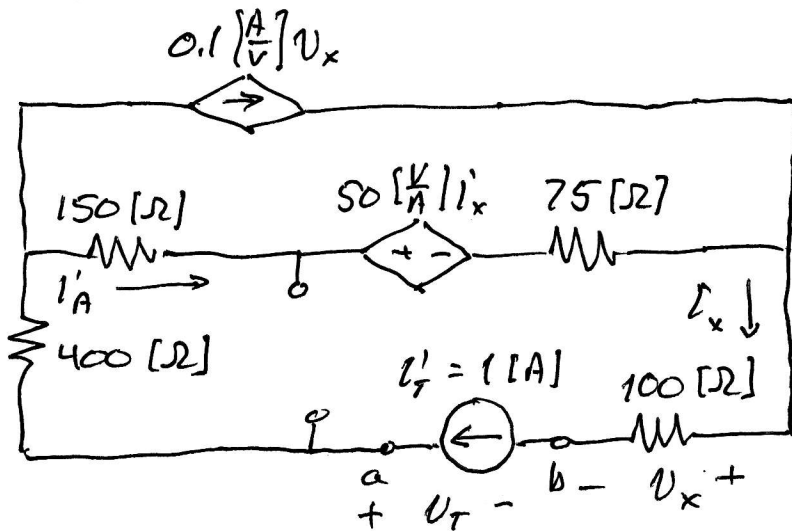
$$V_{OC} = -10.5 \text{ [V]}$$

$$V_{TH} = V_{OC} = -10.5 \text{ [V]}$$



Room for extra work

A test source will also simplify things. we will use a test current source then  $i_x$  will be known. Note also that  $275 [\Omega]$  can be ignored since it is in series with a current source.



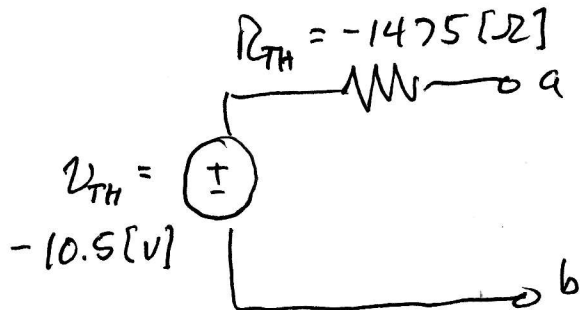
$$i_x = 1 \text{ [A]}$$

$$\Rightarrow v_x = 100 \text{ [V]}$$

$$i_A' = 1 - 0.1(100) = -9 \text{ [A]}$$

$$-v_T + 400(1) + 150(-9) + 50(1) + 75(-9) + 100(1) = 0$$

$$v_T = -1475 \text{ [V]} \Rightarrow R_{TH} = -1475 \text{ [\Omega]}$$



we must have a, b labeled on the circuit diagram, or else we won't know the correct sign of  $v_{TH}$ .