جامعة بيرزيت

BIRZEIT UNIVERSITY

Faculty of Engineering and Technology

Electrical and Computer Engineering Department

Circuits LAB (ENEE2102)

Pre-LAB of Experiment #4

Network Theorems

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Instructor:

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Date:

20/9/2020

Section: #1

Part A: Proportionality:

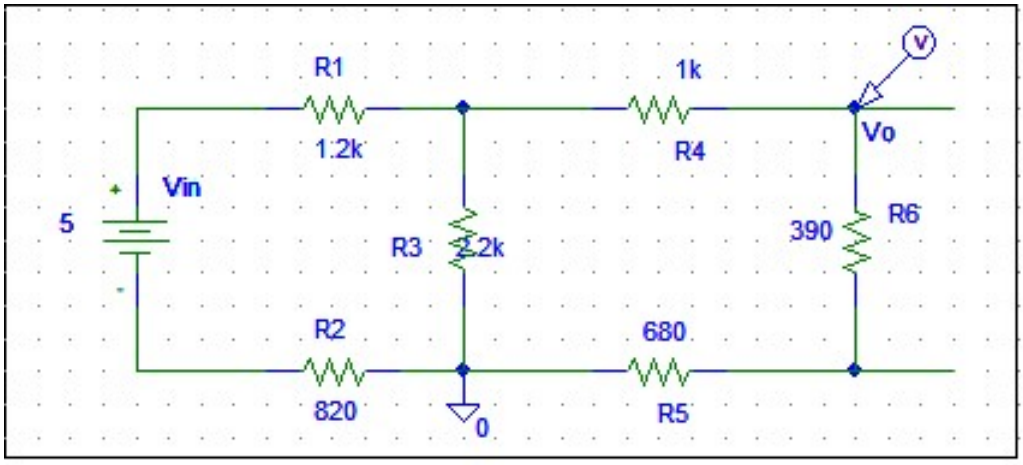
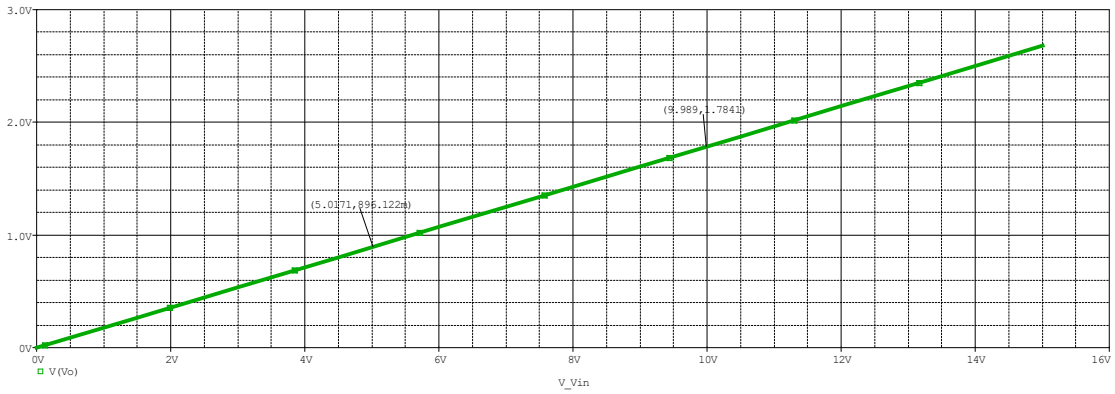


Fig (4-1)



Plot (4-1)

- When $V_{in} = 5$:

$V_O = 896.122mV$.

- When $V_{in} = 10$:

$V_O = 1.7841V$.

Part B: Superposition:

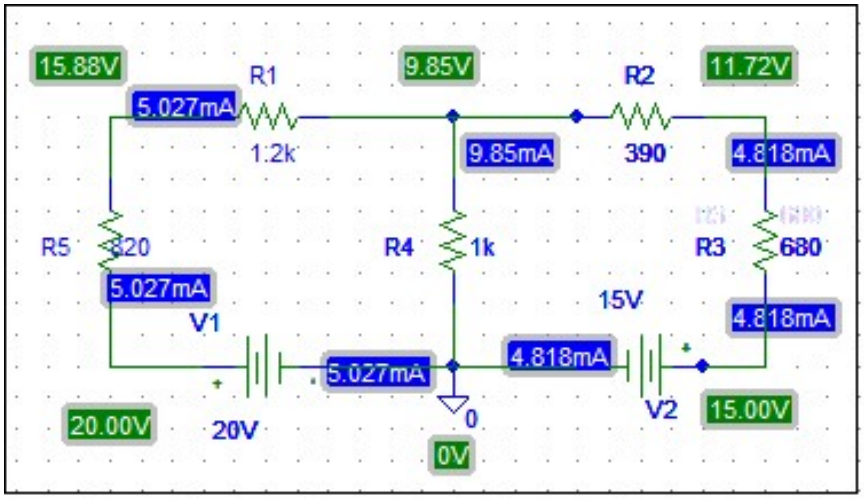


Fig (4-2)

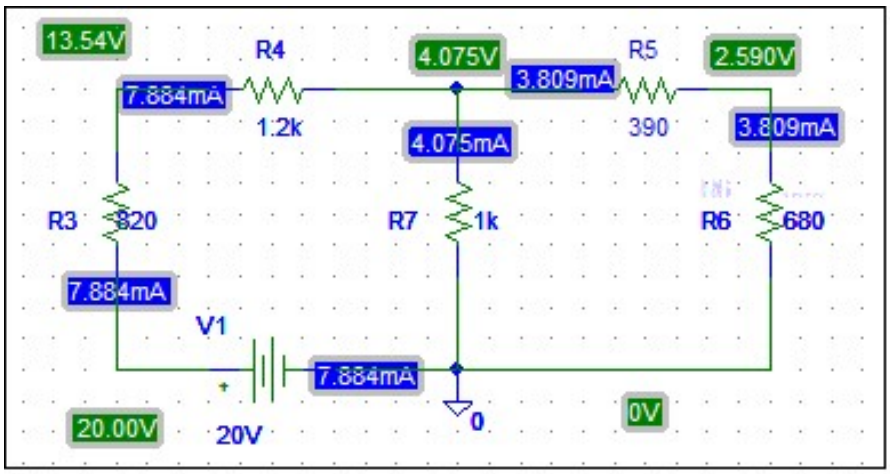


Fig (4-3)

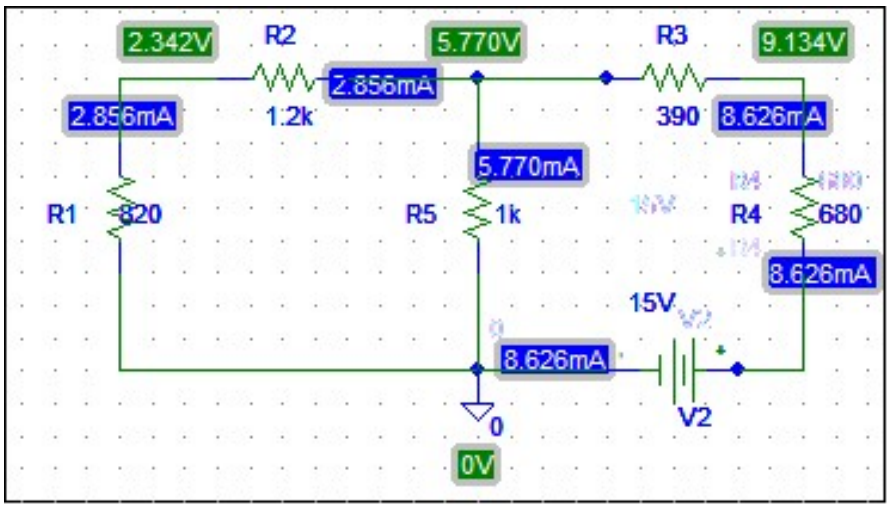


Fig (4-4)

Part C: Thevenin's Theorem:

A.

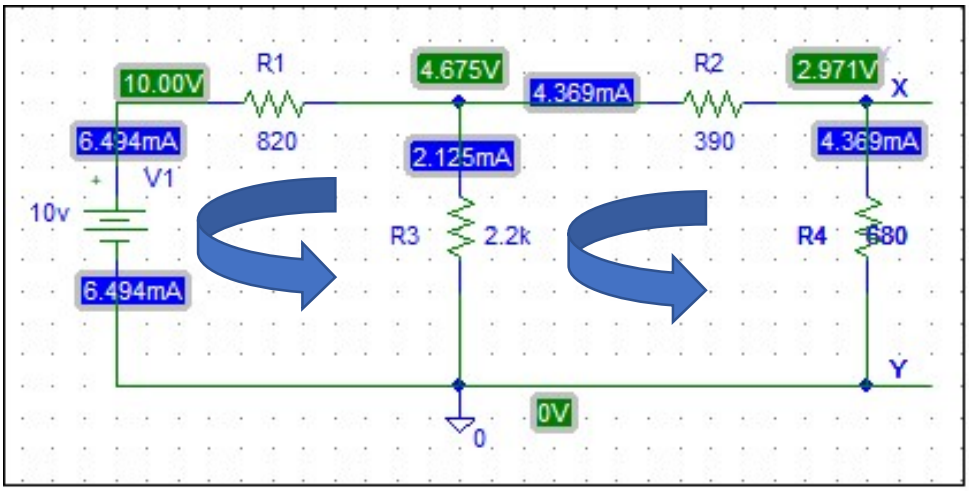


Fig (4-5) a

To find R_{th} remove R4 and replace it with open circuit, and replace V1 with short circuit:

$R_{th} = (2.2k \,//\, 820) + 390 = 987.35\ \Omega$

To find V_{th} replace R4 with short circuit, with KCL:

$V_{th} = 7.2v$

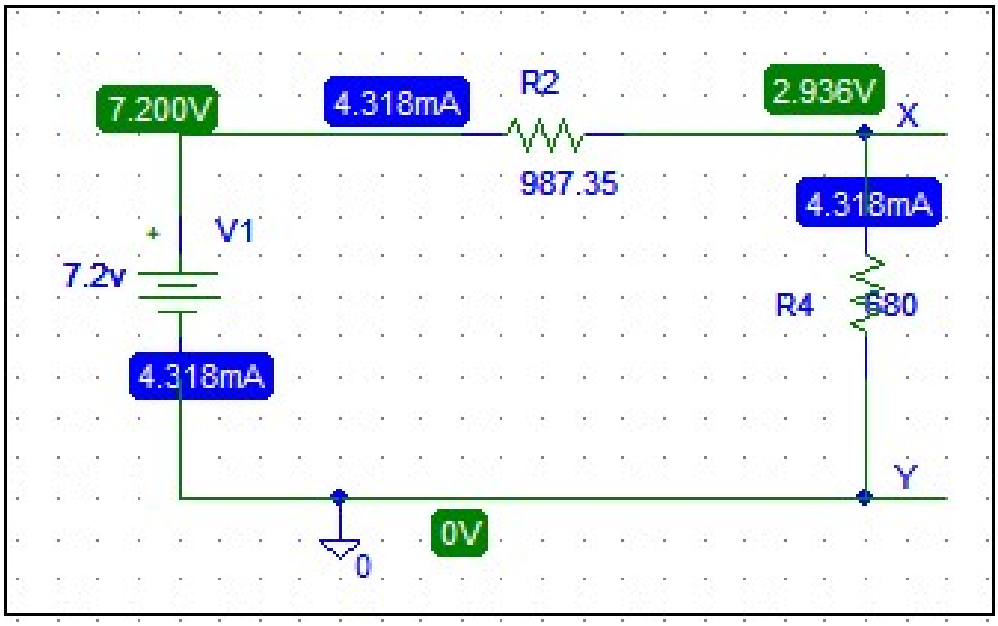


Fig (4-5) b

Part D: Δ-Y Transformation:

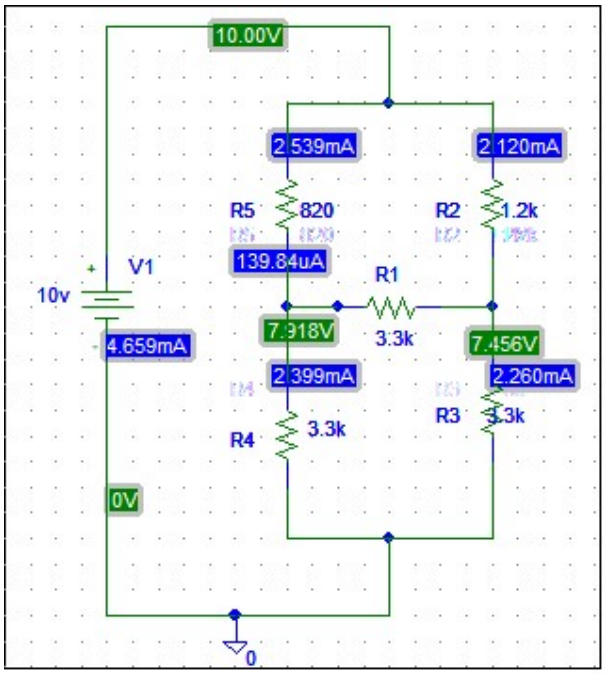
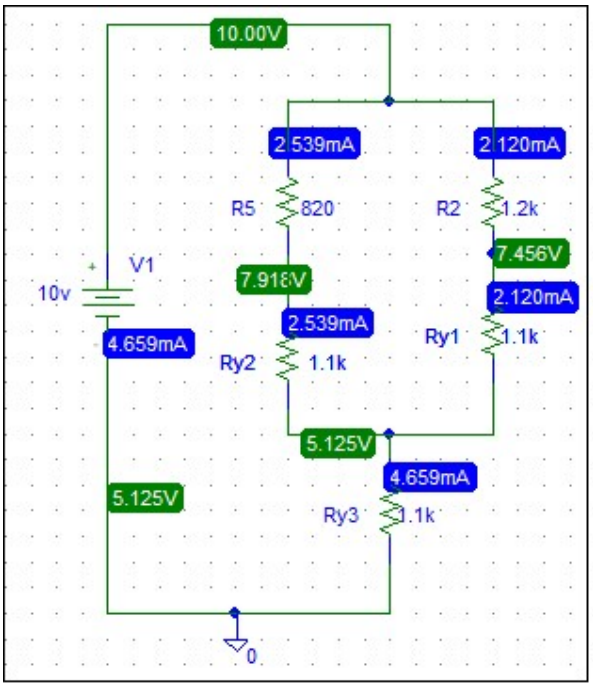


Fig (4-8) a

Y-Delta Transformation:

$R_{y1} = R_{y2} = R_{y3} = \frac{3.3k}{3.3k*3} = 1100\ \Omega$



Y Transformation

Fig (4-8) b

Part E: The Reciprocity Theorem:

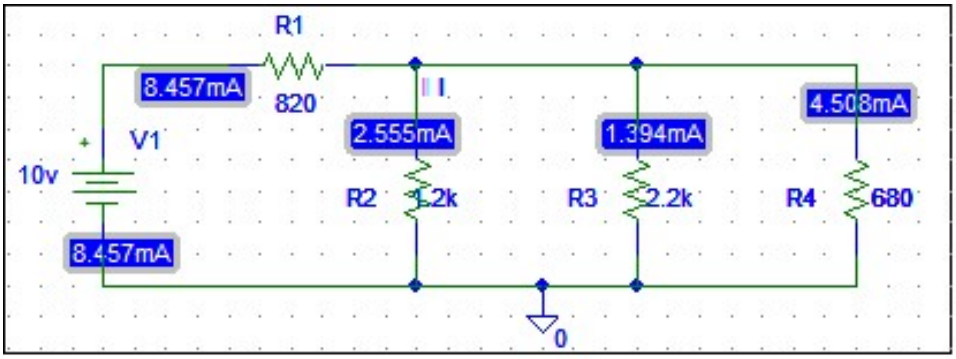


Fig (4-9)

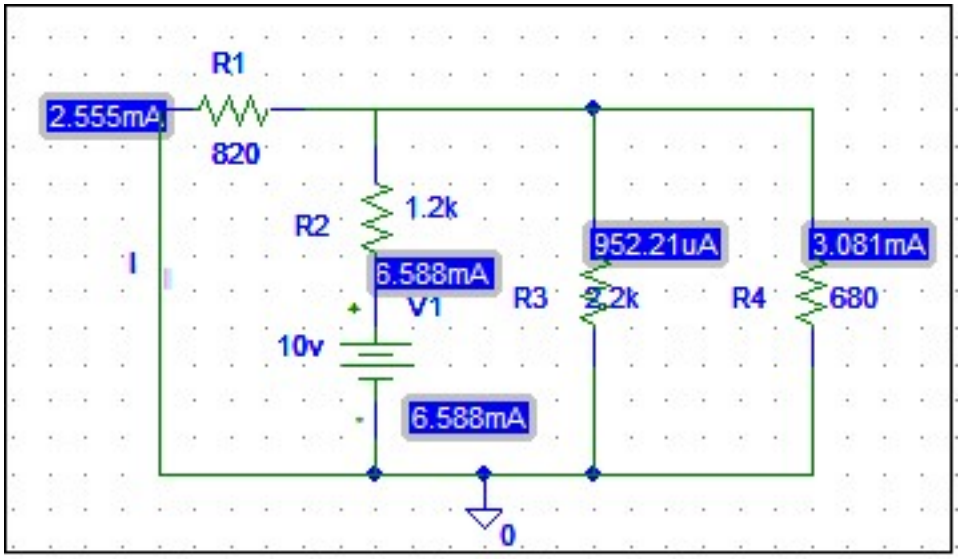


Fig (4-10)