Summer 2022

CSE250 – Circuits and Electronics

Practice Problems

(Nodal analysis, Mesh analysis, Source transformation)

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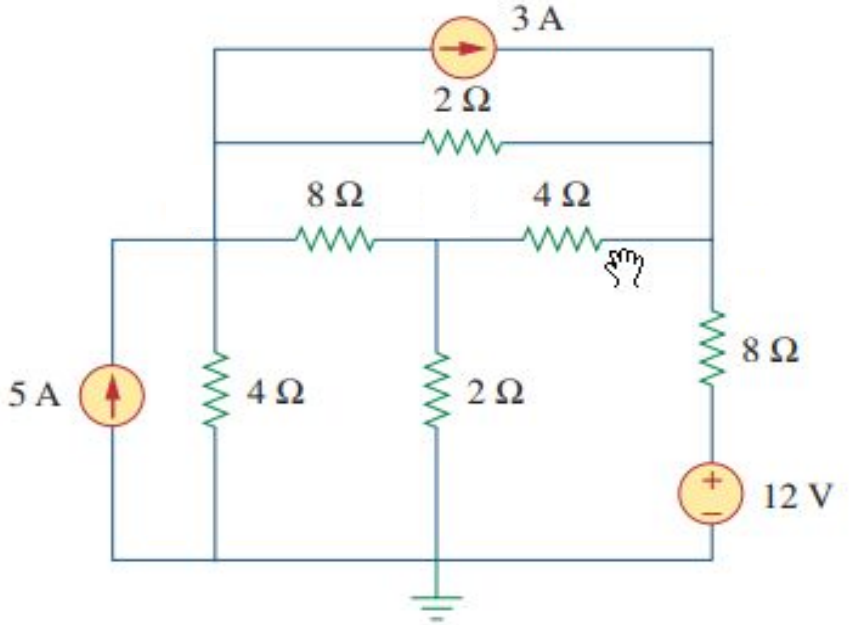
Problem 1

Use nodal analysis to determine the voltage across the **3A** current source. What is the power of the it? Is it absorbing or supplying?

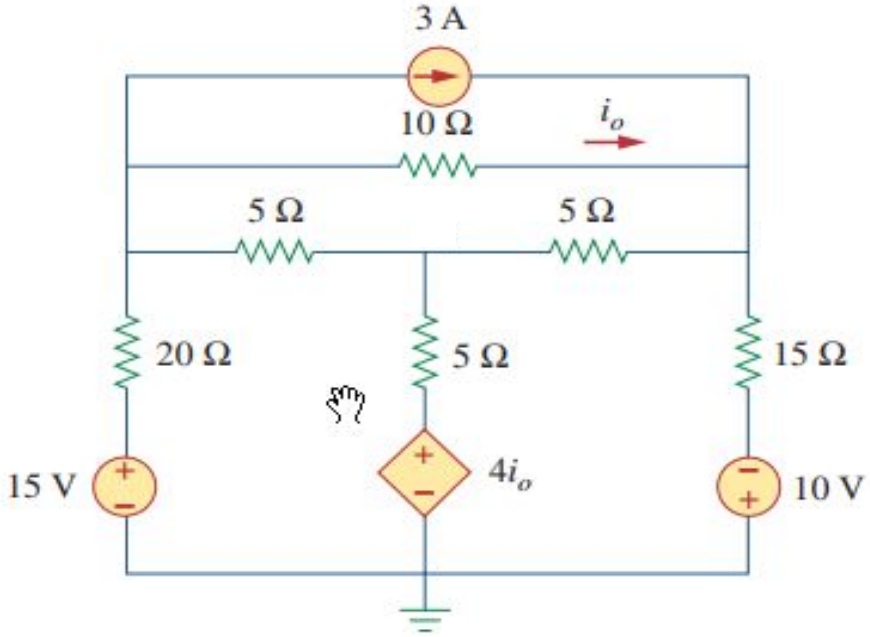


Ans: Node voltages = **0 V; 10 V; 4.933 V; 12.267 V;**

Voltage across the 3A source = **± 2.267 V**

Problem 2

Use nodal analysis to determine the voltage across the **3A** current source. What is the power of the it? Is it absorbing or supplying?

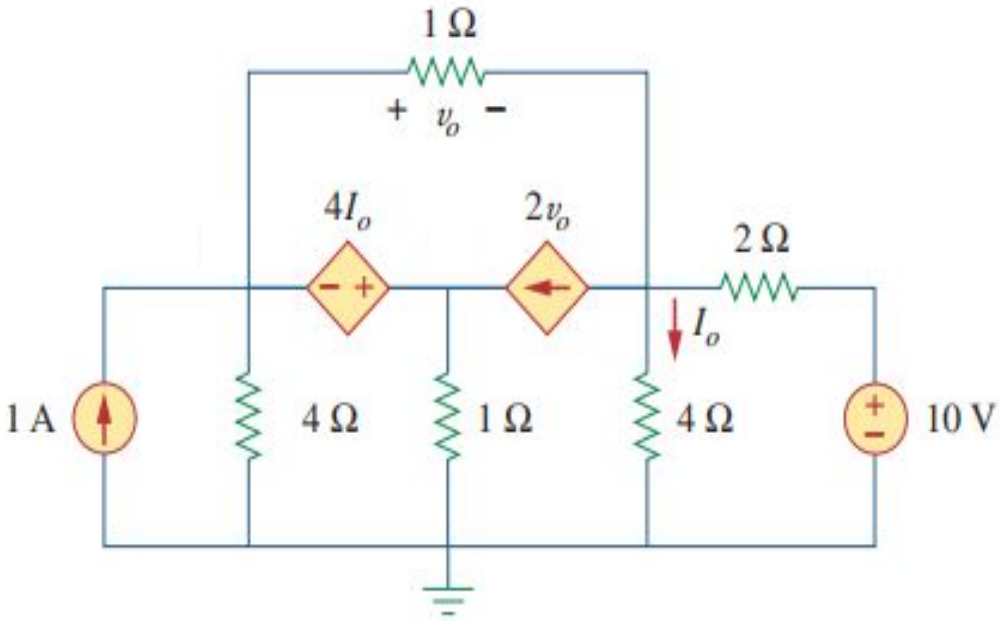


Ans: Node voltages = **0 V; - 7.19 V; - 2.78 V; 2.89 V;**

Voltage across the 3A source = **- 10.08 V**

Problem 3

Use nodal analysis to determine the current through the $4I_0$ source.

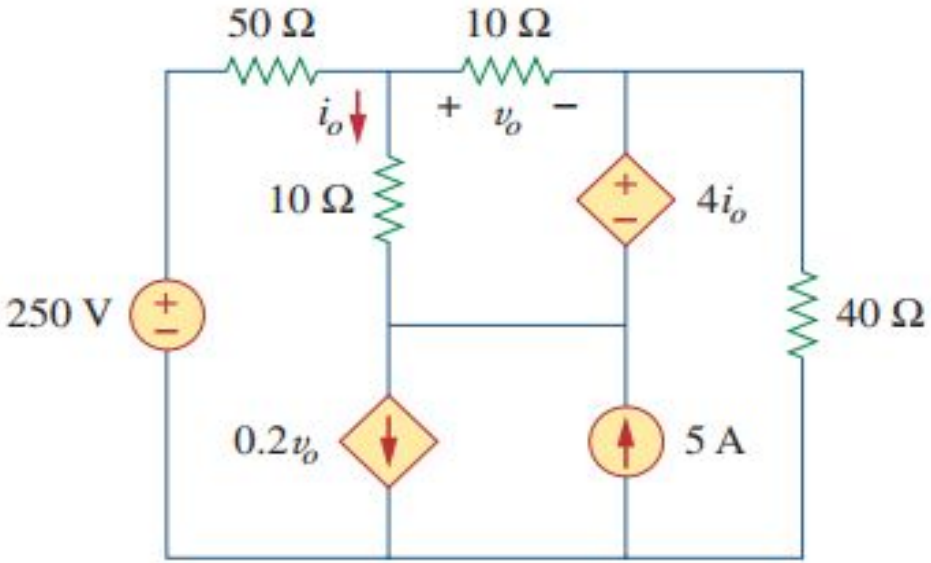


Ans: Node voltages = **0 V; 4.97 V; 4.85 V; - 0.12 V;**

Current through the $4I_0$ source = **± 5.33 A**

Problem 4

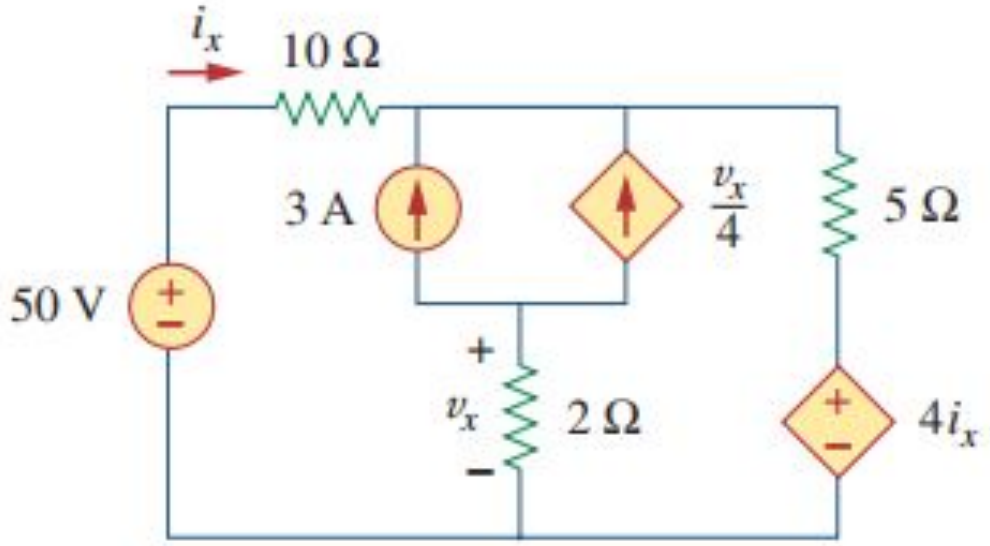
Use mesh analysis to determine v_0 and i_0. What is the voltage across the 5A source?



Ans: $v_0 = 2.941$ V; $i_0 = 0.49$ A

Problem 5

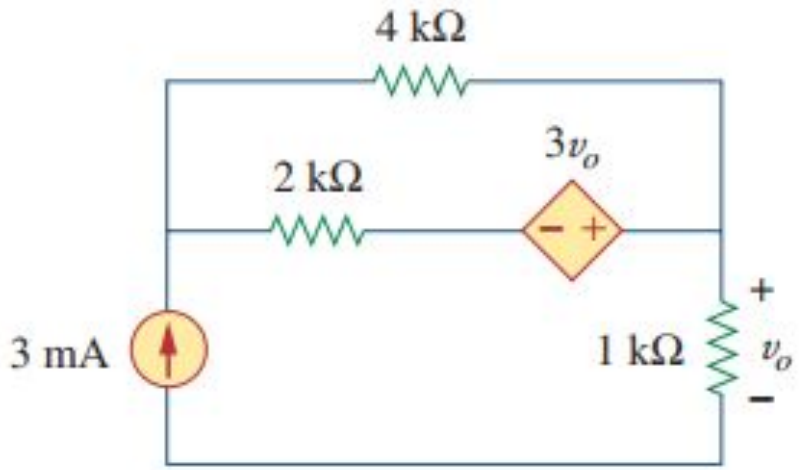
Use mesh analysis to determine v_x and i_x. What is the voltage across the 3A source?



Ans: $v_x = -4$ V; $i_x = 2.105$ A

Problem 6

Use source transformation to find v_o



$\Lambda\,\varepsilon = {}^{0}\Lambda$:suV

Thank you for your attention