# EECS 70A: Network Analysis
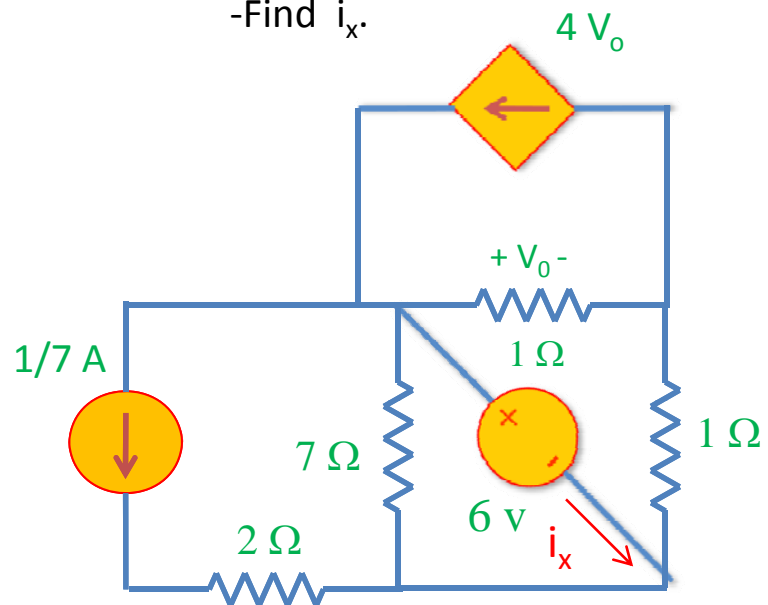
Homework #3

Due in discussion section,

Wednesday, May 5, 2010.
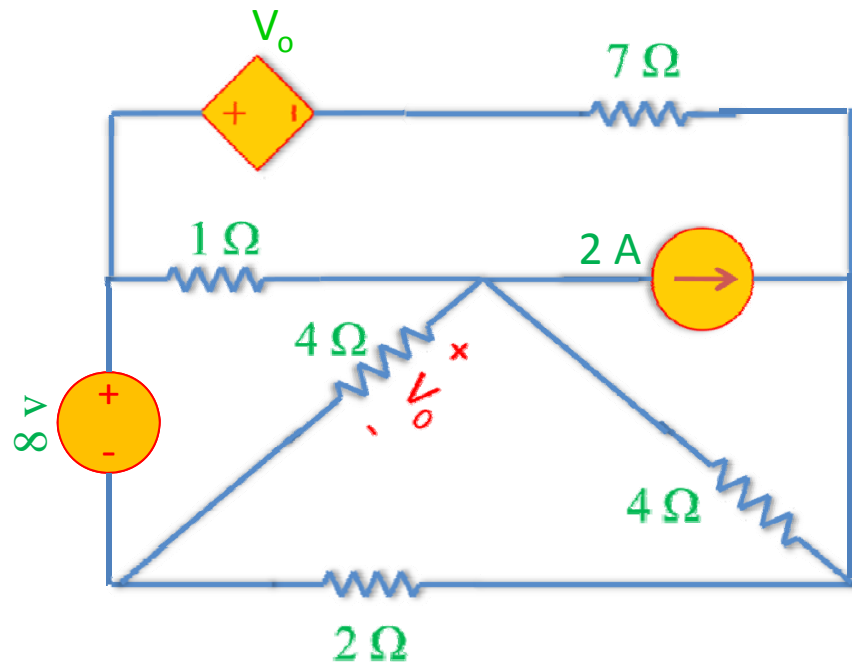
## Problem 1:
-Use nodal analysis to find all node voltages.

-Find $i_x$.

$4 V_0$

$+ V_0 -$

$1 \Omega$

$1/7 A$
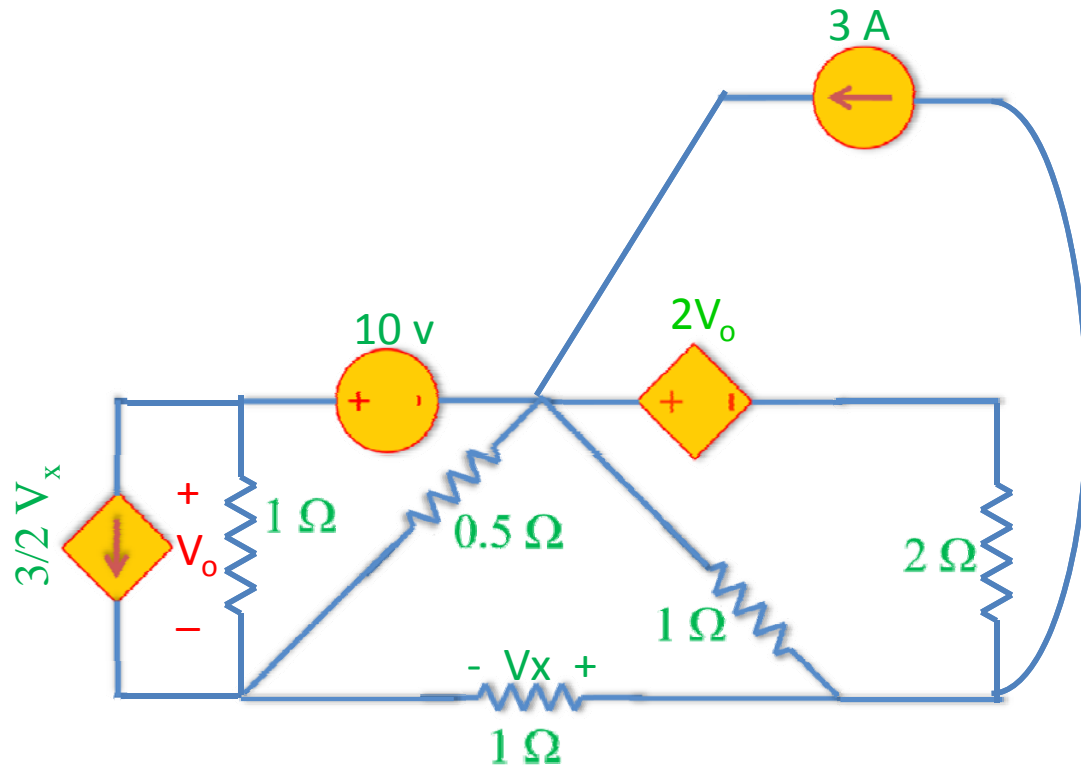
$7 \Omega$

$1 \Omega$

$6 v$
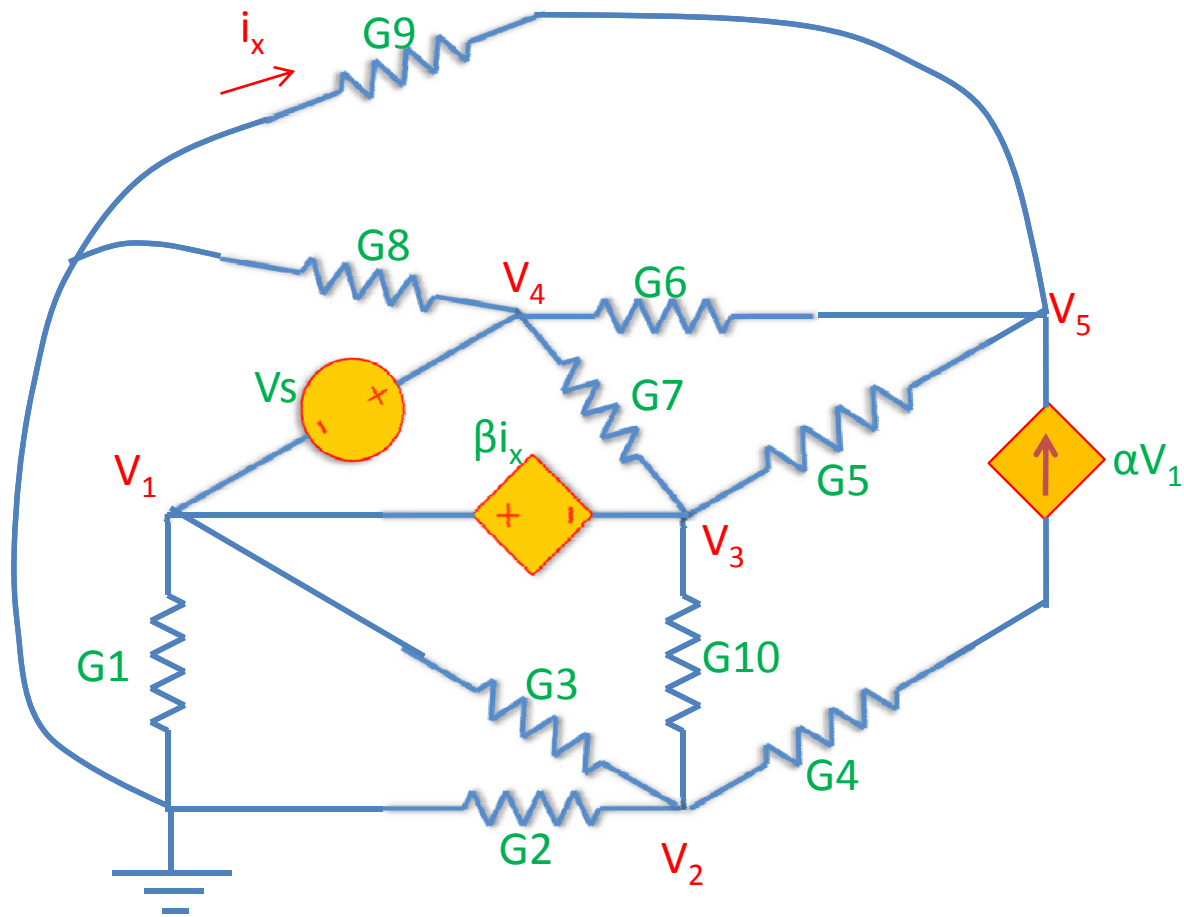
$2 \Omega$
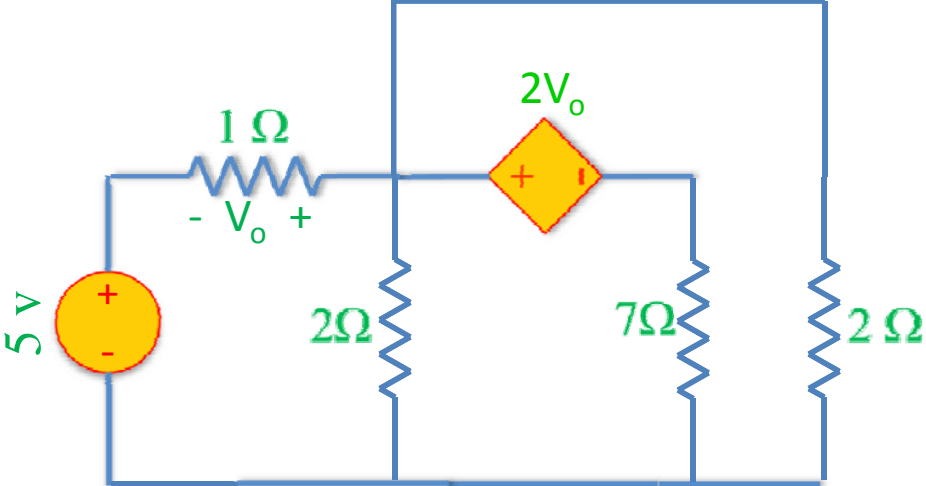
$i_x$

Problem 2: Solve for node voltages.

# Problem 3:

-Use nodal analysis to find node voltages.

-Find the power supplied by the independent current source.

Problem 4: Write the node-voltage equations and put them in matrix form.
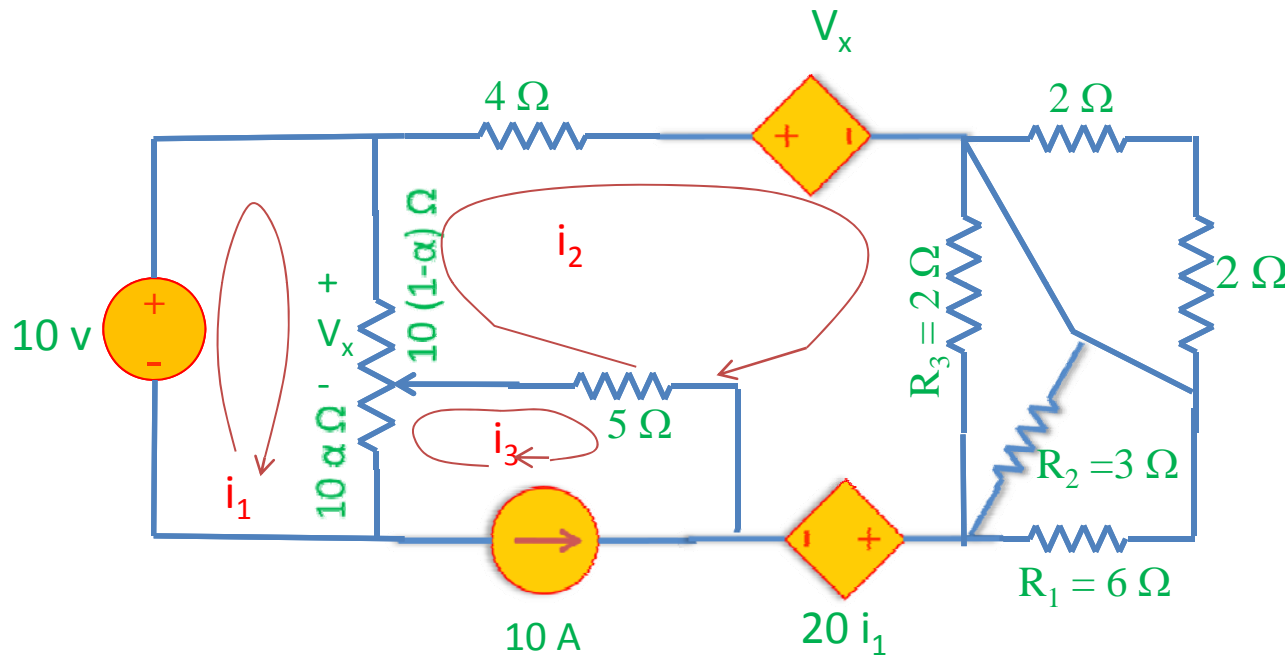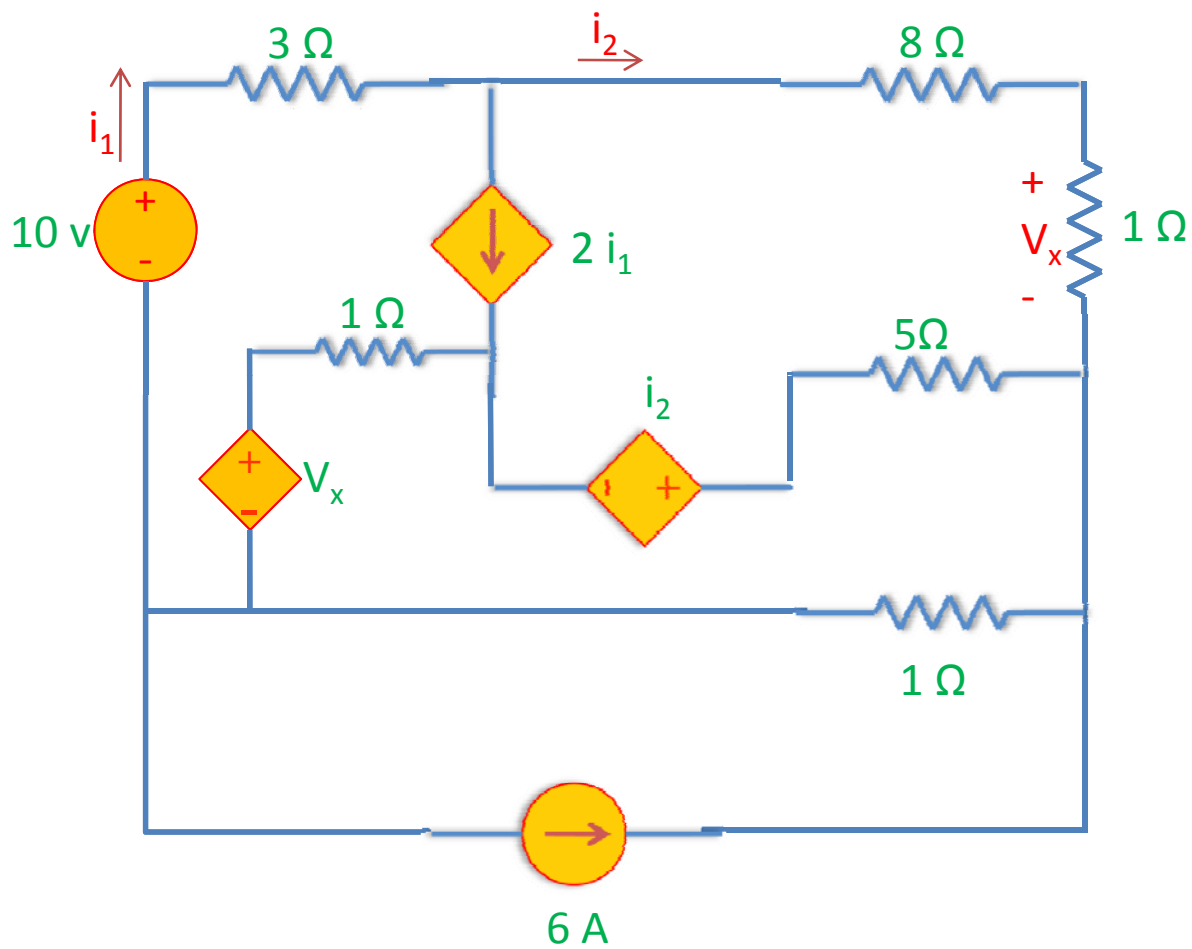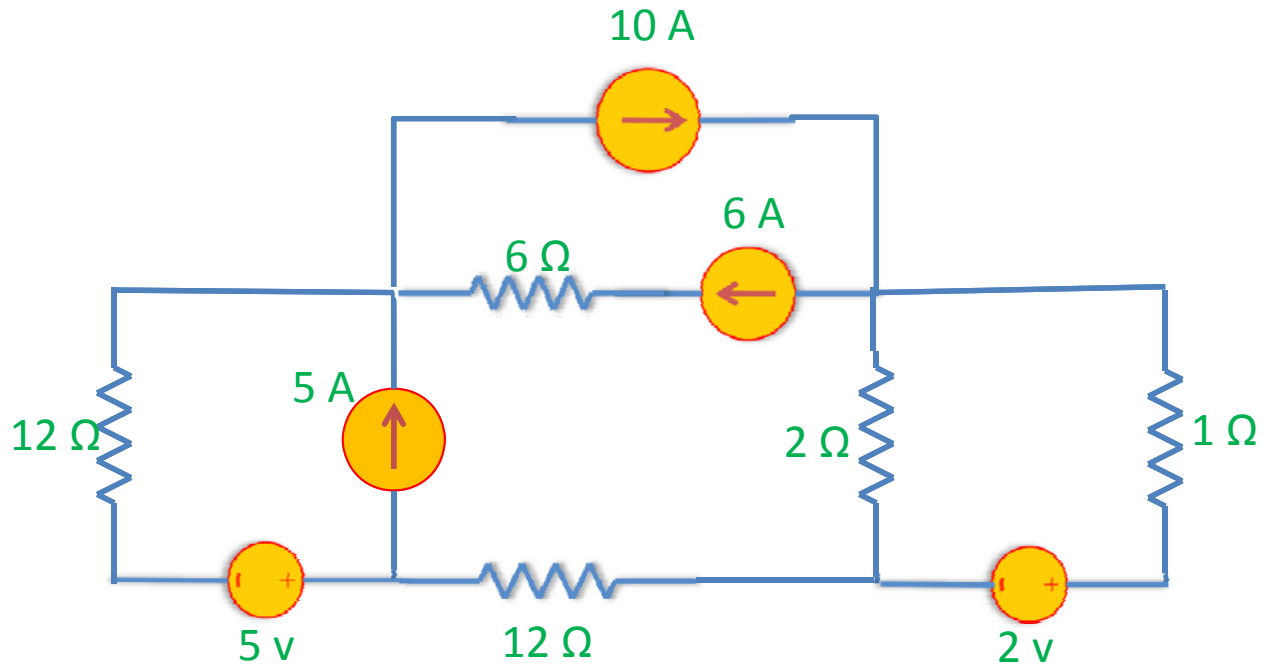
Problem 5: Solve for mesh currents.

## Problem 6:

-Obtain mesh currents $i_1$ through $i_3$ (in terms of $\alpha$).

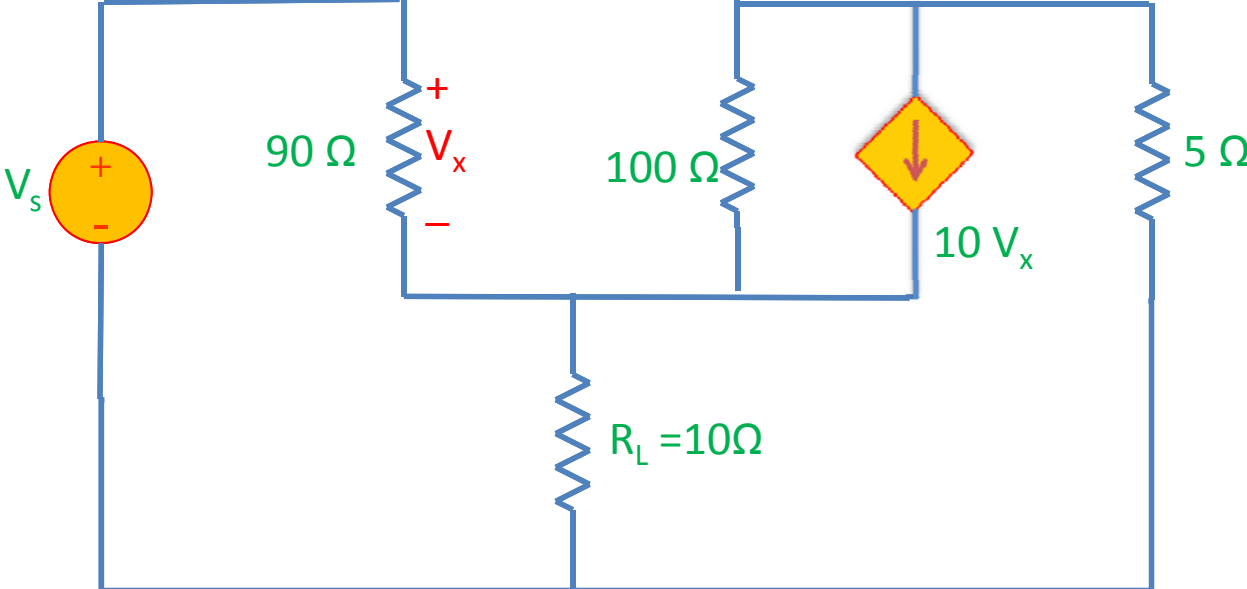- Find the total power dissipated in $R_1$, $R_2$ and $R_3$ (P1+P2+P3 in terms of $\alpha$).



$V_x$

4 Ω

2 Ω

$i_2$

10 (1-α) Ω

+

$V_x$

-

10 α Ω

$i_1$

$i_3$

5 Ω

+

$R_3 = 2$ Ω

2 Ω

$R_2 = 3$ Ω

$R_1 = 6$ Ω

10 v

10 A

20 $i_1$

Problem 7: Solve for mesh currents.



3 Ω

$i_2$

8 Ω

$i_1$

10 v

2 $i_1$

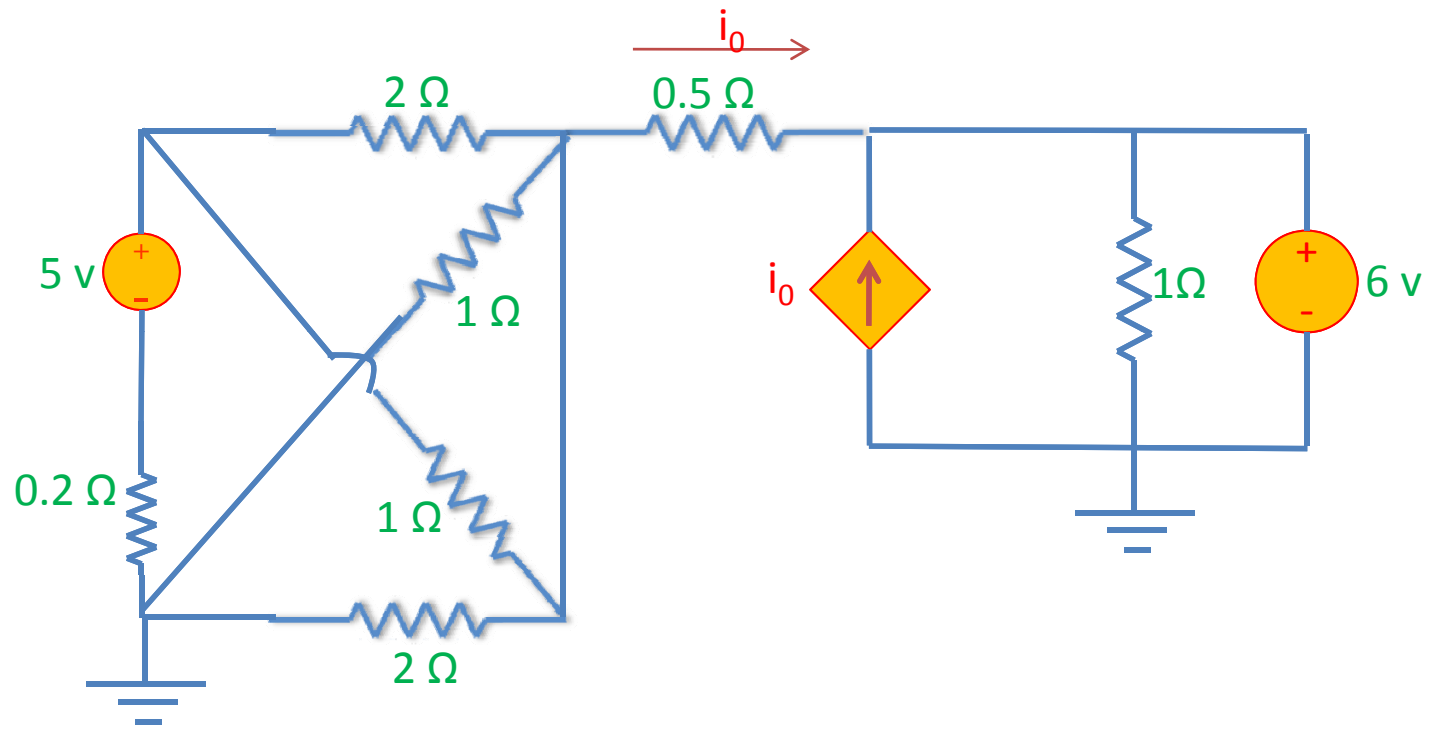$V_x$  1 Ω

+
−

1 Ω

5Ω

$i_2$

$V_x$

+
−

+

1 Ω

6 A
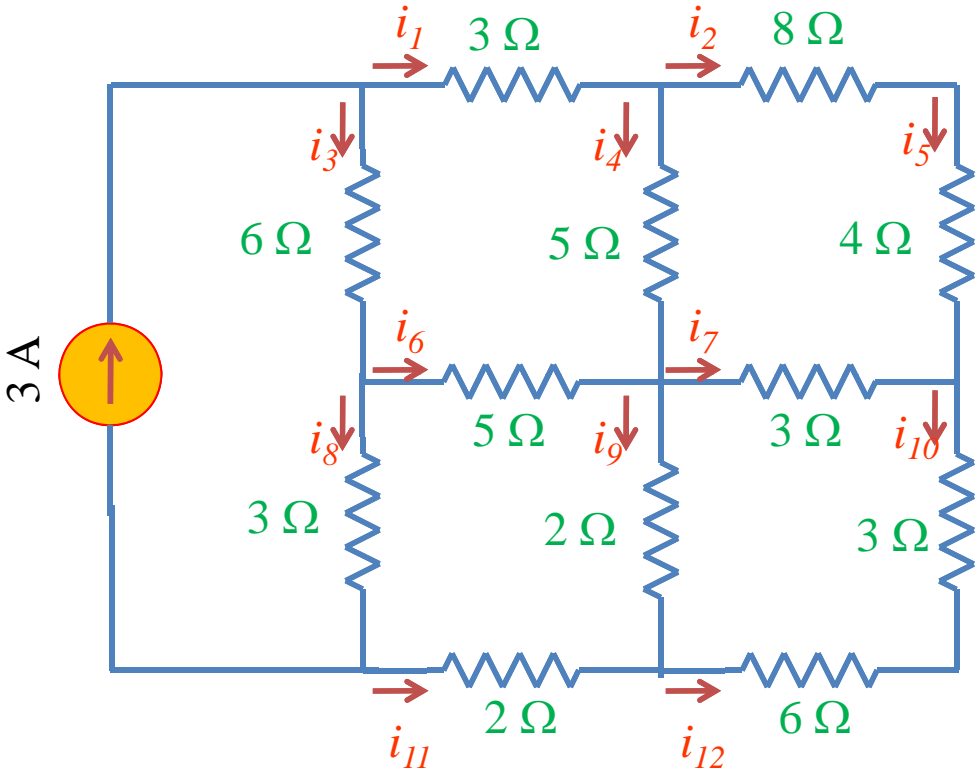
Problem 8: Solve for mesh currents.

Problem 9: Use your circuit analysis skills to find the ratio of the power absorbed by $R_L$ to the power supplied by Vs.

Problem 10: Find $i_0$.

Problem 11: Find node voltages and
currents.

EXTRA CREDIT: Find node voltages and currents