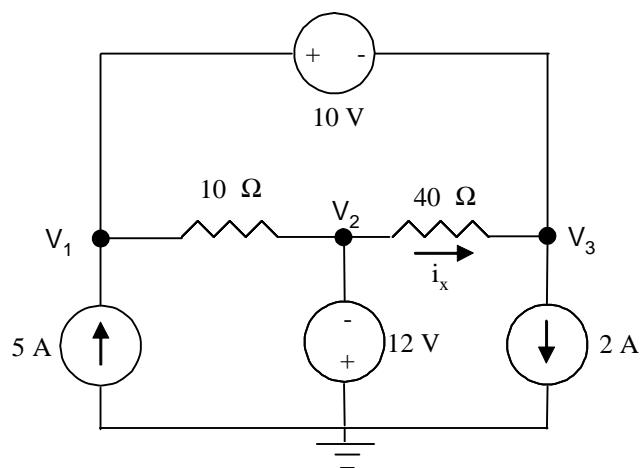


Nayda G. Santiago,

100 points

## Problem 1 (25 points) Node-voltage method

Use the node-voltage method to find all node voltages and  $i_x$  in the following circuit. Do not simplify the circuit.



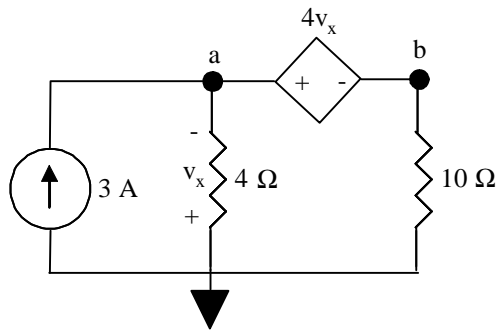
Node voltages = \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

 $i_x =$  \_\_\_\_\_

## Exam 2 INEL 3105

Initials \_\_\_\_\_ Last 4 digits ID \_\_\_\_\_

Problem 2 (25 points) Determine the node voltages for the following circuit.

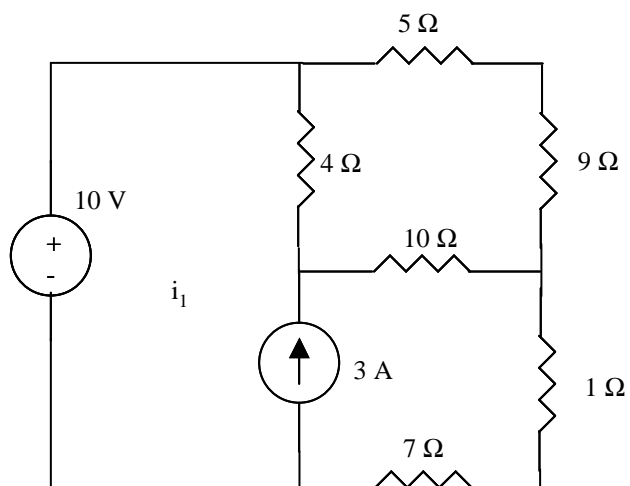
 $V_a = \underline{\hspace{2cm}}$  $V_b = \underline{\hspace{2cm}}$

Initials \_\_\_\_\_

Last 4 digits ID \_\_\_\_\_

Problem 3 (25 points)

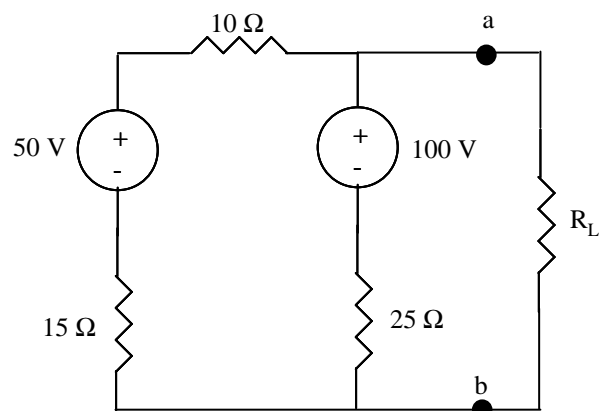
Problem 1 (25 points). Mesh-current analysis

Use mesh-current analysis to determine the current  $i_1$  in the following circuit. Do not simplify the circuit.

Initials \_\_\_\_\_

Last 4 digits ID \_\_\_\_\_

Problem 2 (25 points) Maximum power transfer  
For the following circuit:



- (15 points) Find the Thevenin equivalent at terminals a-b for the circuit shown.
- (5 points) What is the value of  $R_L$  for maximum power transfer?
- (5 points) What is the maximum power that could be dissipated in  $R_L$ ?

Initials \_\_\_\_\_

Last 4 digits ID \_\_\_\_\_

## Problem 3 (25 points) Source transformations

Use source transformations and resistance combinations to simplify the circuit until only two elements remain to the left of terminals  $a$  and  $b$ .

