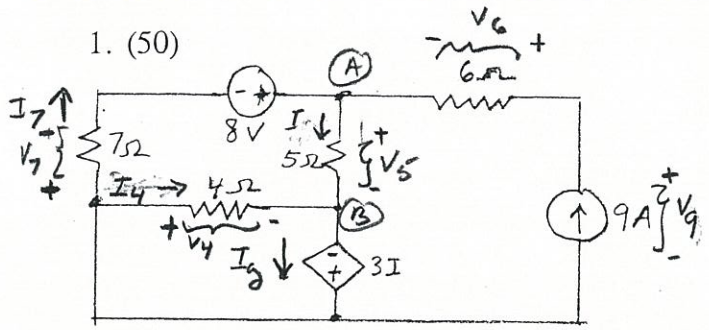
ECE 252 | **Introduction to Electrical Engineering** | **Quiz 3P**
100 Points | **Show your work.** | **Practice Solution**

1. (50)



Label the diagram with currents and voltages. Write enough equations to solve for the current through and the voltage across each element. Do not solve.

Ohm's law:

$V_4 = 4I_4$

$V_5 = 5I$

$V_6 = 9 \cdot 6$

$V_7 = 7I_7$

KCL:

Node A: $-I_7 + I_5 - 9 = 0$

Node B: $-I_4 - I + I_g = 0$

KVL:

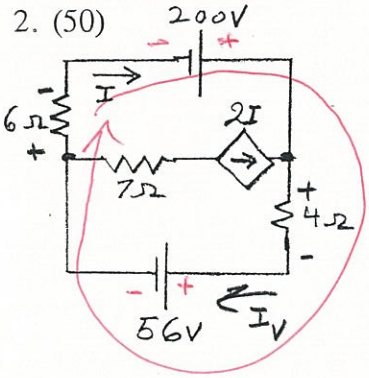
$V_4 - 3I = 0$

$V_7 - 8 + V_5 - V_4 = 0$

$3I - V_5 - V_6 + V_9 = 0$

9 eqns, 9 unknowns

2. (50)



Find I

KCL: $I + 2I - I_V = 0 \Rightarrow I_V = 3I$

KVL: $6I - 200 + 4I_V + 56 = 0$ (outside loop)

$6I - 144 + 4(3I) = 0$

$18I = 144$

$I = \underline{\underline{8A}}$

An alternate solution is to define an unknown voltage across the 2I current source, then write 2 KVL equations — one for the top mesh and another for the bottom mesh.