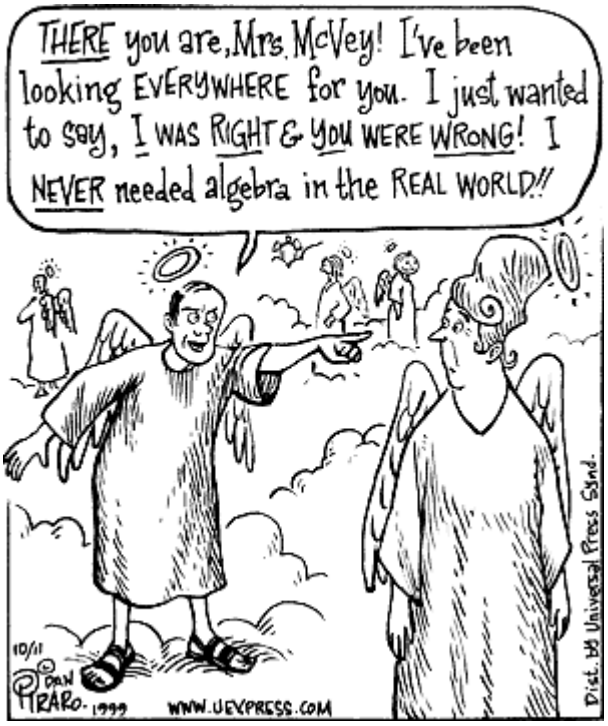
EE 302, Introduction to Electrical and Computer Engineering

Dr. Archie Holmes, Jr.

Exam #3

Name: _____

SSN: _____



Please remember….

- **Read the entire exam before starting**
- **If you feel you need more information than is given, please ask!!!**
- **Show all work for credit!!!**
- **Relax!!!**

This exam contains 11 pages and 4 problems along with some extra credit questions
Give units to all answers where applicable

Problem #1	_____
Problem #2	_____
Problem #3	_____
Problem #4	_____
Bonus (Extra Credit)	_____
Total	_____

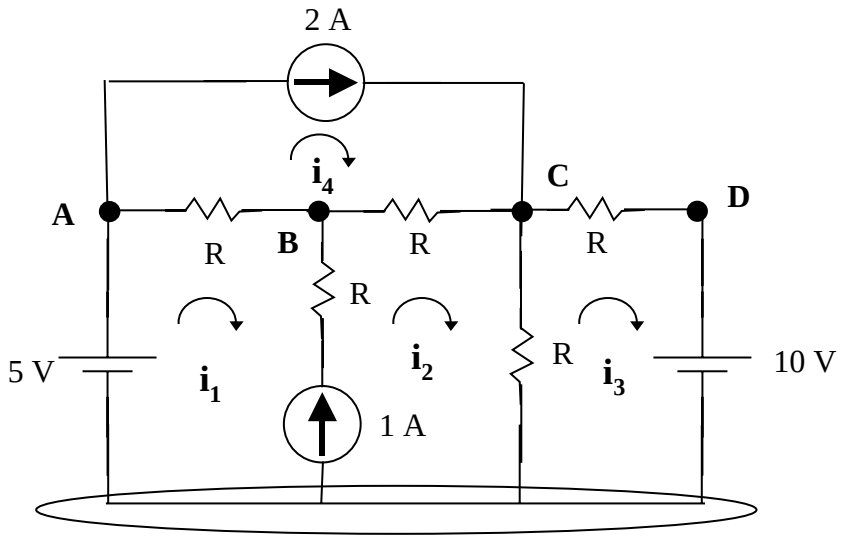
This information will be provided when I return the exam

Class Average = _____

Standard Deviation = _____

PROBLEM #1: NODE VOLTAGE AND MESH CURRENT ANALYSIS (30 POINTS)

In the circuit below:



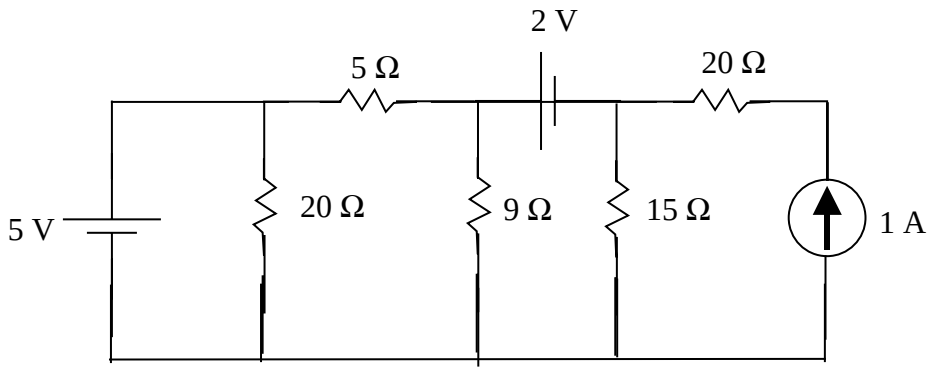
(a) Write **all** of the equations needed to analyze the circuit using nodal analysis and the node definitions provided.

(b) Write **all** of the equations needed to analyze the circuit using mesh current analysis and the mesh current definitions provided.

(c) Picking **one of these two methods**, solve for the power being supplied by the 1-A current source when R = 7Ω. Use the next page to show your work as needed.

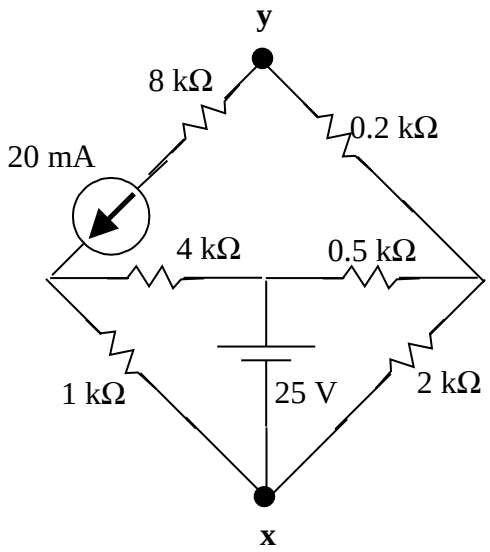
PROBLEM #2: THEVENIN AND NORTON EQUIVALENT CIRCUITS (20 POINTS)

Using **superposition**, determine the Thevenin and Norton equivalent circuits when the 9-Ω resistor is considered the load resistor.



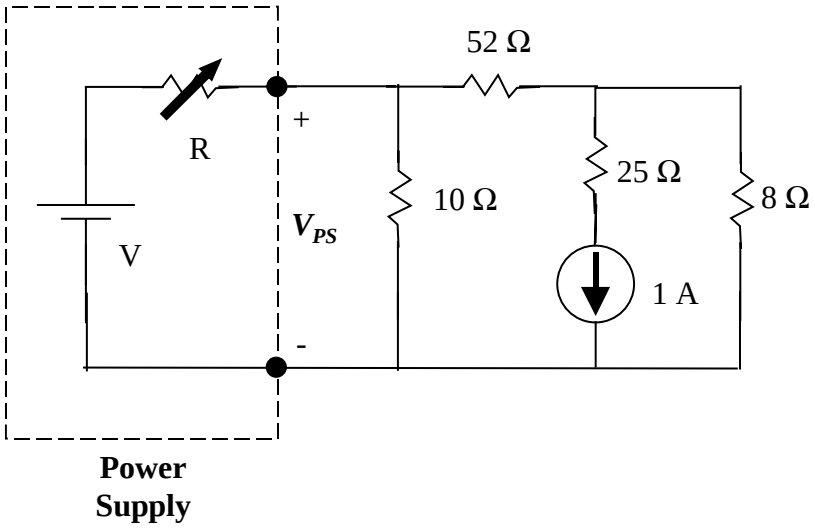
PROBLEM #3: GENERAL CIRCUIT ANALYSIS I (20 POINTS)

Using **any** of the methods discussed in class (Node voltages, mesh currents, or superposition), calculate v_{xy} in the circuit below.



PROBLEM #4: GENERAL CIRCUIT ANALYSIS II (30 POINTS)

The goal of this problem is to design the power supply (which consists of a voltage source and a resistor as shown in the dashed box) in the circuit below.



a) For the specific application, it is required that both of these conditions be true:

- Maximum power is being dissipated by the 10-Ω resistor
- The 8-Ω resistor dissipates **no** power

Calculate values for the resistor and the voltage source within the power supply which makes **both** conditions true.

b) Using the values from part (a), calculate the power being dissipated in the 10-Ω resistor and the power being **supplied by the power supply**.

c) What **values** can the 10-Ω resistor become in order for the new resistor to absorb 100 W of power?

BONUS SECTION (3 POINTS)

1) As of the end of the day on Tuesday, indicate in which range the Dow Industrial Average resides:

____ Less than 10,000

____ Between 10,000 and 10,500

____ Between 10,500 and 11,000

____ More than 11,000

2) Briefly, what did the judge find in the suit by the US government against Microsoft?

3) I am always looking for good fiction or non-fiction book to read. Please recommend one which you really enjoyed and tell me which genre (mystery, sci-fi, etc.) it is in.