Problem Set # 2
Due: 5 PM Tuesday, Sep. 13th, 2005 in 240 Cory

Reading: Hambley 3rd Ed. 1.2-1.6, 2.1-2.5

2.1 KCL and KVL
   a) Write KCL for the circuit below.
   b) Find Vx.
   c) Write KVL for the circuit below.
   d) Find Vy.
   e) Determine which devices are absorbing and which devices are delivering power. Is Power absorbed = Power delivered?

![Circuit for problem 2.1](image-url)

Figure 1. Circuit for problem 2.1
2.2 Nodal Analysis
a) Find $V_a$, $V_b$ and $V_c$ in the circuit below using nodal analysis.

![Figure 2. Circuit for problem 2.2](image)

2.3 Voltage Divider and Limitations
Consider the circuit shown in figure 3, where $V_m$ is a voltmeter and $V_{in}$ is an input voltage.

a) Use resistor parallel and series combinations to find branch voltage divider formula when there is no current into the voltmeter.
b) Use KCL and/or KVL to find branch voltage divider formula when there is no current into the voltmeter.
c) Use resistor parallel and series combinations to find branch voltage divider formula when the voltmeter has a finite resistance $R_v$.
d) Use KCL and/or KVL to find branch voltage divider formula when the voltmeter has a finite resistance $R_v$.
e) Use the formulae to evaluate the percentage error in the voltage due to a voltmeter resistance of 20 Mohms.

![Figure 3. Circuit for problem 2.3](image)