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Engineering 210
Quiz #7
Post-Mortem

Class,
Quiz #7 is done and finalized. The average for quiz #7 is 10.92. All papers have been graded and returned to the Glennan labs. Solutions for quiz #7 are up on the website. Please check blackboard for errors and contact me if there are any.

Post Quiz Analysis

Problem 1: Few students recognized that the Op-Amp was set up in a Non-Inverting circuit. The voltage source was connected directly to the non-inverting input so you should have expected a non-inverted output. In an inverting configuration the input voltage goes to the inverting input.. Also, be sure to use the correct formula! (Especially now that you have the Formula Sheet to use on quizzes.)

As mentioned in class and recitation (and shown in the solutions) if you don't recognize the circuit configuration you should always fall back to using the basic Op-Amp constraints (Vp=Vn and Ip=In=0). However, you should realize that it is only the positive and negative INPUT currents that are zero. There can be (and almost always will be) an output current. Unless you are using the internal model of the op amp you should never do KCL or a voltage divider at the output of the op amp!

Problem 2: Many students had problems with this problem. There are several ways to go about solving for the Thevenin equivalent. But there were some pretty common mistakes that I'd like to highlight:

- You cannot assume Ix is independent of the load. In fact, if you do the math, it is very much dependent.
- You cannot assume that there are Vs volts across the 100 Ohm resistor. This happens to be true in the case of a short-circuit load, but is definitely not the case for an open circuit load.
- You cannot do Mesh-Current analysis without setting up a supermesh equation for the dependent current source (or otherwise getting it out of the way).
- You CAN do source transformations---so long as you do them correctly!
    - If you transform the left Voltage source and resistor, you need to make sure you put Ix into the transformed circuit---it is NOT the current through either the new current source, nor the new resistor!
    - If you transform the dependent source and right resistor, you need to be careful about how you draw them in. Realize that the parallel combination (current source || resistor) connects from node a to node Thus, the series combination (voltage source + resistor) must connect from node a to node b. Also, there should be nothing connected to the node between the transformed voltage source and resistor.
- Lastly, you cannot do look-back resistance in a circuit with a dependent source.