

Homework Assignment #2 – due in BRKI 368 at 4:30 pm on Friday, Sept. 20, 2013

Instructions, notes, and hints:

You may make reasonable assumptions and approximations in order to compensate for missing information, if any. Provide the details of all solutions, including important intermediate steps. You will not receive credit if you do not show your work.

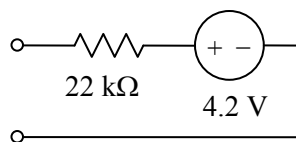
Prob. 3.67: There are no components connected to terminals *a-b* for this problem. Note that you are to find the TEC “seen by” the 6-Ω resistor. That is, the 6-Ω resistor is not part of the circuit being modeled by the TEC.

Prob. 3.79: Note that there are no *independent* sources in the circuit, but there is a *dependent* source.

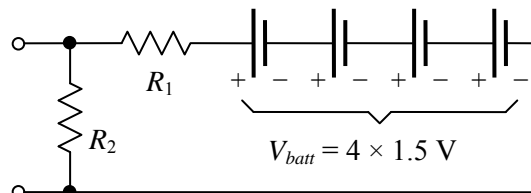
Assignment:

Probs. 3.66, 3.67, and 3.79 in the textbook plus the following additional problems:

- Suppose that an electronic device needs to be excited by a circuit that has the TEC shown below on the left. However, the only source of power is an assembly of four series-connected 1.5-V AA cells. With the correct resistor values, it should be possible to use a circuit like the one shown below on the right to achieve the desired results. What values should R_1 and R_2 have in order for the circuit on the right to act like the desired TEC on the left relative to the indicated terminals?



Desired TEC



Actual Excitation Circuit

- The device shown below left is a widely used transistor type called an n-channel MOSFET. Its gate (G) terminal has been tied to its drain (D) terminal. The third terminal is called the source (S). The MOSFET model shown below right is sufficient for simple DC analyses. Find the Thévenin equivalent of the circuit shown below right relative to terminals *d-s*. The two terminals labeled with the voltage v_{gs} define a gap (open circuit) across which v_{gs} is measured. That is, no significant DC current flows into the gate terminal of a MOSFET.

