

## Simple resistive circuits: SPICE simulation

It's time to learn how to use SPICE (Simulation Program with Integrated Circuit Emphasis) to “build” and simulate circuits on the computer. We start by using SPICE to perform simple DC simulations on some (very) familiar circuits consisting of only resistors and sources. In later exercises, we will expand our capability with SPICE to include many other components and types of analysis. We will see that SPICE allows us to do calculations that are impractical — or even impossible — to do by hand.

There is a separate web page with information about setting up and using SPICE — use the link on the EE201 page menu bar to get there. There are three versions of SPICE that you can install on your computer. Any of them are acceptable for doing EE 201 or EE 230 exercises — you can choose whichever one you like. Start by working through the introductory tutorial corresponding to your choice of SPICE. Once you understand the basics for doing DC simulations, the following exercises can be done in short order.

### Reporting

Prepare a report describing the results of the SPICE simulations. The report should follow the general rules for good report writing — introduction, conclusion, etc. However, the description of the simulation of each circuit probably requires nothing more than a sentence or two about the circuit, the schematic from the SPICE lay out, the results of the SPICE simulation, and a comparison of the SPICE results to your hand calculations. (It is quite likely that you have done the hand calculations for these circuits already.)

Check the schedule page for the due date.

**Exercises**

Using your preferred version of SPICE, lay out each of the seven circuit shown in the figures below and perform DC operation point simulations.

Show the calculated node voltages and the currents for all components. (Note that you will have to choose appropriate grounds for the circuits in Figs. 2 & 3.) Compare the SPICE simulation results to your hand calculations for each circuit.

Figure 1.

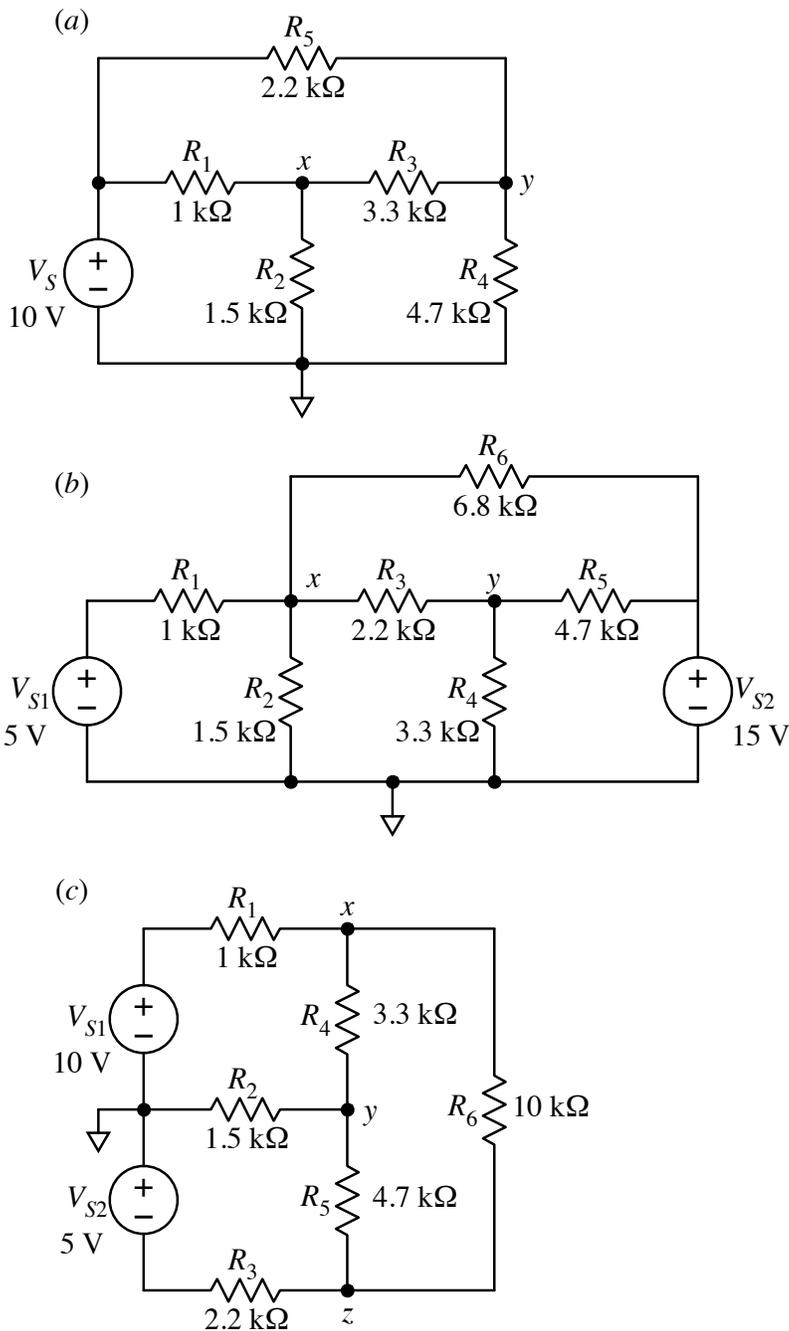
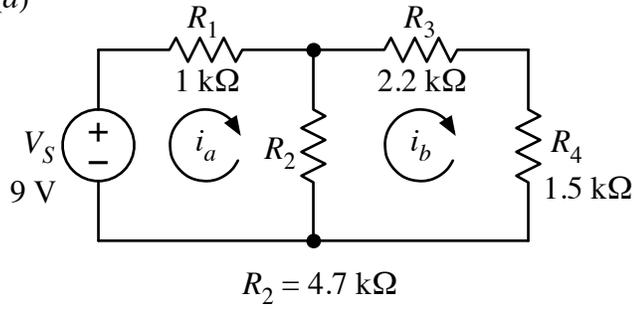


Figure 2. (a)



(b)

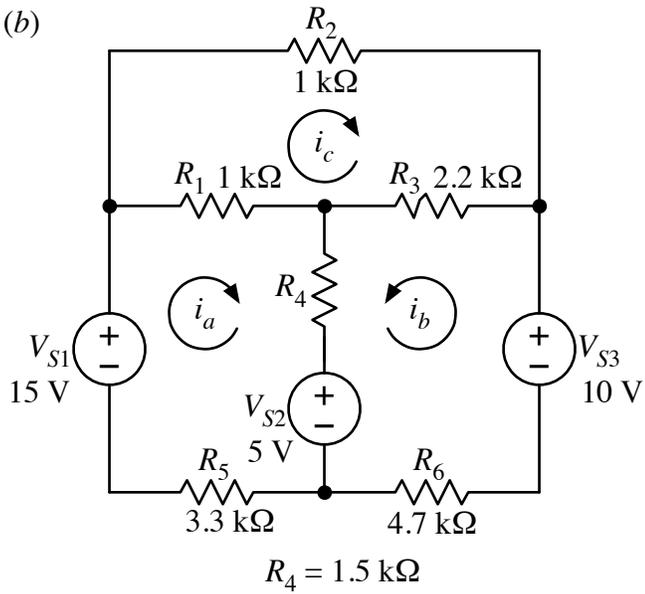
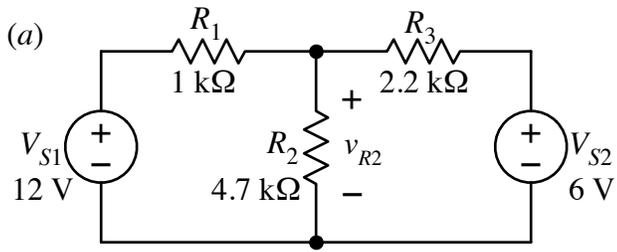


Figure 3. (a)



(b)

