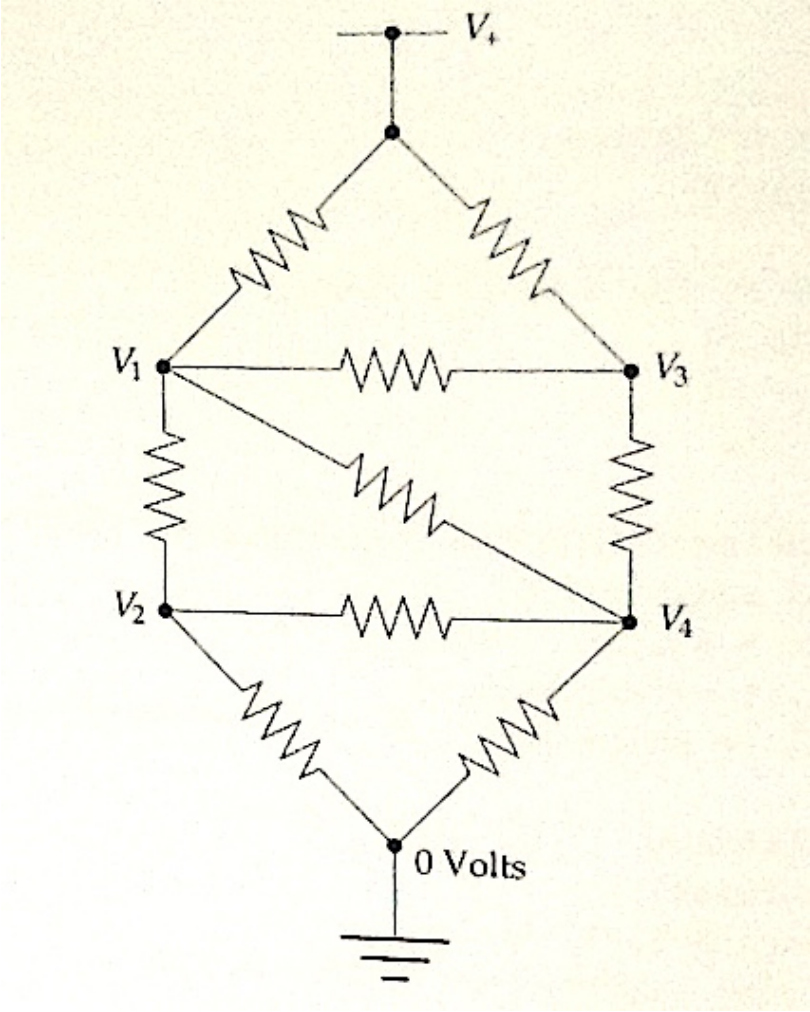
ASTR 260
Homework 4 Due Wed. October 15, 2014 12pm.

1) Consider the following circuit of resistors:



All the resistors have the same resistance R. The power rail at the top is at voltage V+=5V. What are the other four voltages, V1 to V4?
Applying Kirchhoff's current law to the junction at V1 and using Ohm's law (V=RI), we have:

$$\frac{V_1 - V_+}{R} + \frac{V_1 - V3}{R} + \frac{V_1 - V_4}{R} + \frac{V_1 - V_2}{R} = 0$$

or equivalently:

$$4V_1 - V_2 - V_3 - V_4 = V_+$$

a) Write similar equations for all the other three junctions with unknown voltages.
b) Write a program to solve the four resulting equations using Gaussian elimination and hence find the four voltages.