

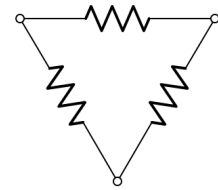
## ELE 215 – Lab 3 – A Triangle of Resistors

### Objectives

- Use basic methods to discover the nominal values of three resistors in a Delta formation.

### Notes

- In the PreLab you considered a virtual circuit of 3 resistors connected in a “Y” configuration; we know from our study of “Delta-Y” circuits that this is equivalent to a resistive triangle. For this hardware lab, you will be given an actual triangular configuration of three resistors, as suggested by the figure to the right, with the resistance values obscured by colored shrink tubing.
- Your goal is to discover the individual values of the three resistances (in the Delta configuration) without cutting any of the wires of circuit or disturbing the color tubing in any way.



### Procedure

#### 1. Measurements and Analysis:

- a) Get your triangle from the TA; record its number on your summary sheet.
- b) Using the DMM, take resistance measurements of your circuit; record them in the space provided on the summary sheet. The measurements suggested in the prelab might help. Take these measurements carefully as their accuracy will impact the quality of your solution.
- c) Use whatever mathematical procedures that you can think of to figure out the resistor values.
  - Hint – if you use the DMM to measure across two corners of the triangle, the measurement will be a function of all three resistors.
  - The delta-wye transformation methods might be useful.
  - Note that I do not want actual resistance values, but the nominal values shown on the bins: in this case they should all be in the range from 5.6 k ohms to 100 k ohms, a subset of those values in the PreLab.
  - Don't forget units!
- d) Return your triangle to the TA.

#### 2. Reporting: your submission has two portions:

- a) Similar to the prelab, a link to an online site is provided on the course website for you to enter your three resistor values for immediate grading.

- b) Scan the summary sheet to a single page pdf document to show your measurements and the stamp that you returned the triangle to the TA. Upload it to the ELE 215 Brightspace site. Please use the following convention for the filename: for example,

Lab\_3\_543.pdf

in which you use the final 3 digits of your own HW (not URI) ID.

- c) The total score for this laboratory is 50 points: 45 points for the correct resistors entered online and 5 for the submitted summary sheet.