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**PH 1120 - Electric Potential & Determining Resistance Lab Report**

**Remember to use equations and show your work**

**Your Name: ?? Section: ??**

**Partner’s Name: ?? Date ??**

1. Can two equipotential surfaces with different potential values ever intersect or cross? Explain your reasoning.
2. Do the numerical values of equipotentials increase or decrease the closer the equipotentials are to a negative charge? Explain your reasoning.
3. Write each of the four least-squares results for the resistance (slope) measurements, including their individual uncertainties, in [standard form](file:///%5C%5Cstorage.wpi.edu%5Chomes%5Cphysics%5Cpublic_html%5CLabs%5CHyperlinks%20-%20Documentation%5CThe%20proper%20way%20to%20communicate.html). Also, write down the average ± standard deviation of the four slope values in standard form.

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| **Resistance****Values (Ω)** | **Individual Uncertainties****(±)** |
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|  |  |
|  |  |
| **Average (Ω)** | **Standard****Deviation (±)** |
|  |  |

1. How does the standard deviation of the resistance values compare to the uncertainties of the individual resistance values? Calculate their ratios. Is one measurement of the resistance using the slope method an accurate way to calculate the resistance?
2. For the resistance value with the smallest uncertainty:
	1. Calculate the absolute value of the difference between the individual resistance (the one with the smallest uncertainty) and the average resistance.
	2. Double the standard deviation and then add double the uncertainty of the individual resistance, i.e. calculate the quantity (2 \* stdev + 2 \* individual uncertainty). Note: adding the individual uncertainty to the quantity (2 \* stdev) accounts for the fact that the individual resistance measurement is not an exact quantity.

If we assume the resistances follow [a normal distribution](https://en.wikipedia.org/wiki/68%E2%80%9395%E2%80%9399.7_rule), then we know that 95% of all resistance values will fall within two standard deviations of the average. Based on your results for 5a and 5b, does your resistance value fall within two standard deviations of the average resistance value?