

name _____

ID# _____

Experiment 3

The Wheatstone Bridge

The Voltage Divider

	Position	Voltage
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____

The Wheatstone Bridge

Spool	Null position
#4	_____
#5	_____
#4 & #5 (series)	_____
#4 & #5 (parallel)	_____

Resistance measurements

Spool	Measured resistance
#4	_____
#5	_____
#4 & #5 (series)	_____
#4 & #5 (parallel)	_____

Analysis

Voltage to wire length ratios

Spool resistance calculations

Spool	calculated resistance	% error
#4	<hr/>	<hr/>
#5	<hr/>	<hr/>
#4 & #5 (series)	<hr/>	<hr/>
#4 & #5 (parallel)	<hr/>	<hr/>

Equations and sample calculations:

(10 points)

A so-called lie detector works in part by measuring the resistance between two points on the subject's skin. Theoretically a person perspires more when he is lying and the resistance of his skin drops. What other reasons could you have for wanting to know the resistance of an object?

Questions

1. Why did the current increase when you closed the knife-blade switch? **(3 points)**

2. Why is it very important to keep the resistance per unit length as low as possible for cable used for house wiring and utility lines? **(4 points)**

3. You have two light bulbs. Does the brighter one have higher or lower resistance if they both operate at the same voltage? (Hint: What are the equations for dissipated power?) **(3 points)**