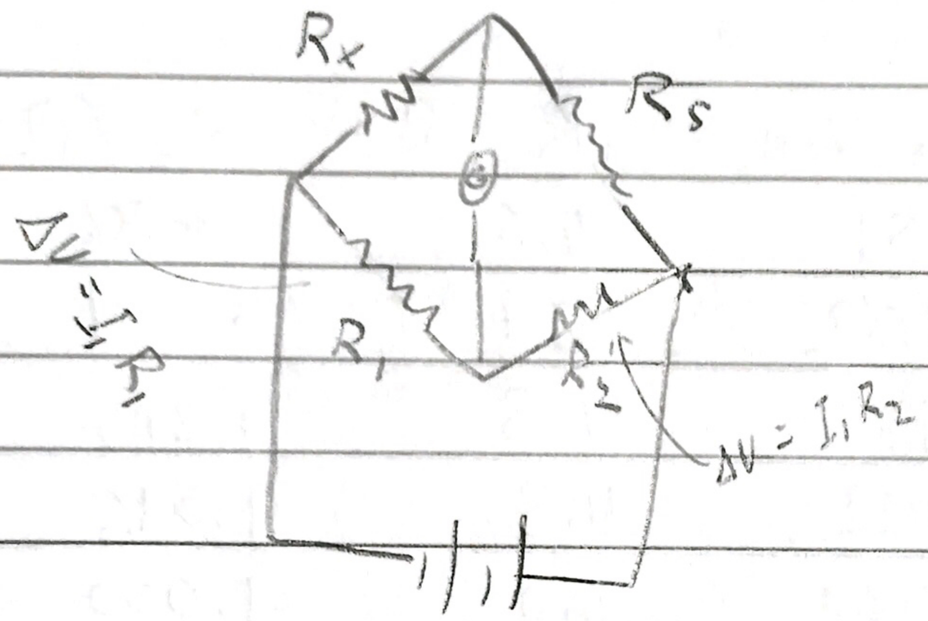
Physics L2B

Wires No.	1	2	3	4	5
L (m)	10, ±0.5	10±0.5	20±0.5	20±0.5	10±0.5
diameter (in)	.025±0.001	.012±0.001	.025±0.001	.012±0.001	.025±0.001
material	Cu	Cu	Cu	Cu	Ni Ag
r 10^{-9} m	3.2	1.6	3.2	1.6	3.2

A



$V = IR$

when G reads 0, $I_1 R_1 = I_2 R_x$

$I_1 R_2 = I_2 R_s$

$\Rightarrow \frac{R_1}{R_2} = \frac{R_x}{R_s}$

Since we only care about the ratio of R_1 to R_2 this is the same as $\frac{L_1}{L_2}$

$\Rightarrow \frac{L_1}{L_2} R_s = R_x$

$V = 1.50$ V

Coil No	L_1 (cm)	L_2 (cm)	L_1/L_2	R_s (Ω)	R_x (Ω)
1	51.55	48.45	1.064	0.5	.5320
2	49.50	50.50	0.9802	1.9	1.862
3	57.20	42.80	1.336	1.0	1.336
4	49.85	50.15	.9946	4.2	4.175
5	49.55	50.45	.9822	9.5	9.330