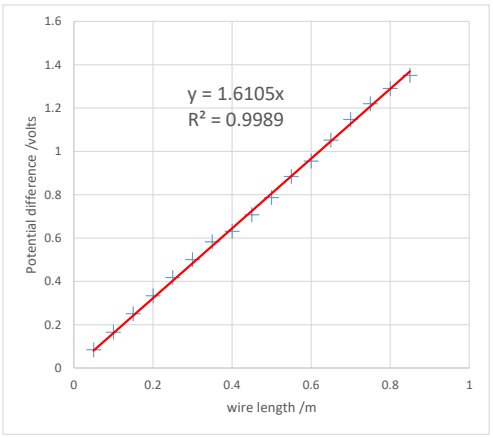
RESITIVITY OF A WIRE A.French Winchester College laboratory P5. 19/10/2020

wire diameter /mm	0.29
cross sectional area /m^2	6.61E-08
current in wire /A	0.1173

← measured with digital calipers.

wire length between electrodes /cm	Voltage /volts	L /m
5	0.084	0.05
10	0.165	0.1
15	0.25	0.15
20	0.333	0.2
25	0.417	0.25
30	0.5	0.3
35	0.582	0.35
40	0.631	0.4
45	0.707	0.45
50	0.786	0.5
55	0.884	0.55
60	0.955	0.6
65	1.052	0.65
70	1.147	0.7
75	1.22	0.75
80	1.29	0.8
85	1.35	0.85

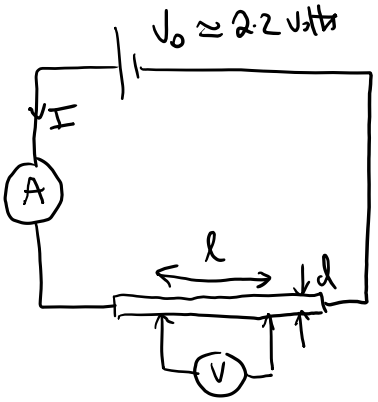


RESISTIVITY OF THE WIRE (ohm m) **9.07E-07**

According to : reference
steel wire has a resistivity of 1 to 10 x 10^-7 ohm metres.
So our result seems plausible.

$\rho = \frac{\pi d^2 k}{4I}$

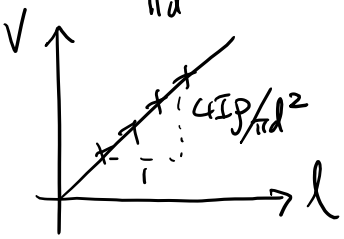
or $\rho = \frac{Ak}{I}$



$R = \frac{\rho l}{\pi (\frac{d}{2})^2}$

$V = IR$

$V = \frac{4I\rho l}{\pi d^2}$



So if $V = kl$

$k = \frac{4I\rho}{\pi d^2}$

$\therefore \rho = \frac{\pi d^2 k}{4I}$