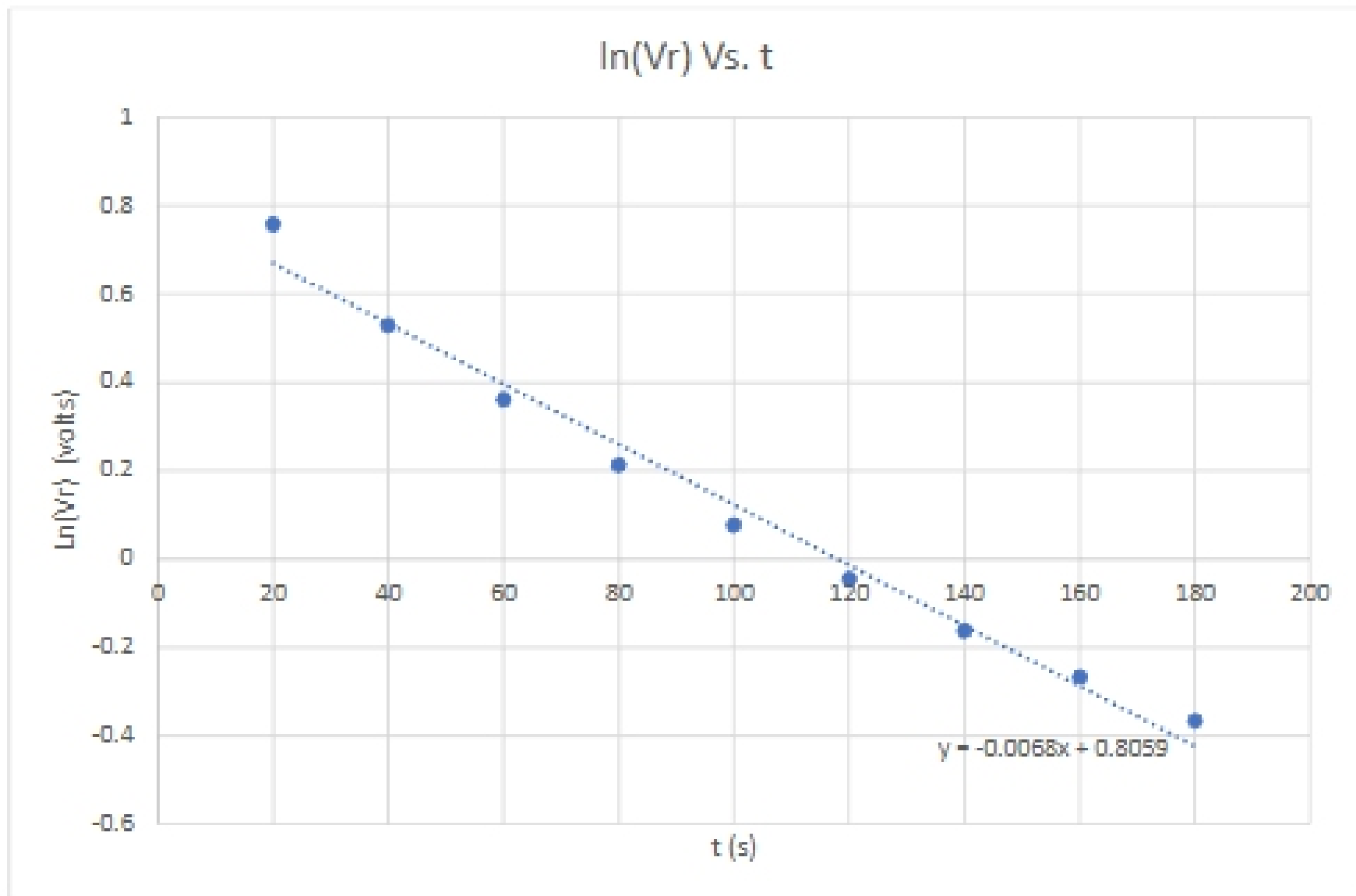


PHY108 LAB EC3

VI-1

V_R (volts)	t (s)	$\ln(V_R)$
2.136	20	0.75893492
1.700	40	0.53062825
1.437	60	0.36255761
1.239	80	0.2143046
1.081	100	0.07788654
0.957	120	-0.0439519
0.851	140	-0.1613432
0.766	160	-0.2665731
0.694	180	-0.3652833



PHY108 LAB EC3

USING LINEST IN EXCEL WE CAN GET THE FOLLOWING FOR $\ln|V_R|$ VS. ϵ

$S = -0.006829$	$\sigma_s = 0.0003280$
$b\text{-INT.} = 0.8059$	$\sigma_b = 0.03691$

AND GIVEN THE EQUATIONS:

$$\ln|V_R| = \ln|\epsilon| - \frac{1}{\tau} \quad S = -\frac{1}{\tau} \quad b = \ln|\epsilon|$$

WE GET:

$$\tau = \frac{1}{S} = \frac{1}{-0.006829 \frac{V}{S}} = 146.434 \frac{S}{V}$$

$$\sigma_\tau = \sqrt{\left(\frac{\partial \tau}{\partial S} \sigma_S\right)^2} = \left(\frac{\sigma_S}{S^2}\right) = \frac{(0.000328 \frac{V}{S})}{(-0.006829 \frac{V}{S})^2} = 7.033 \frac{S}{V}$$

GIVING US $\tau \pm \sigma_\tau$:

$\tau \pm \sigma_\tau = 146 \pm 7 \frac{S}{V}$
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PHY108 LAB EC3

VI-2

V_R (volts)	t (s)	$\ln(V_R)$
2.446	20	0.89445404
1.933	40	0.6590732
1.553	60	0.44018854
1.254	80	0.22633844
1.066	100	0.06391333
0.896	120	-0.1098149
0.762	140	-0.2718087
0.657	160	-0.4200713
0.568	180	-0.5656339

