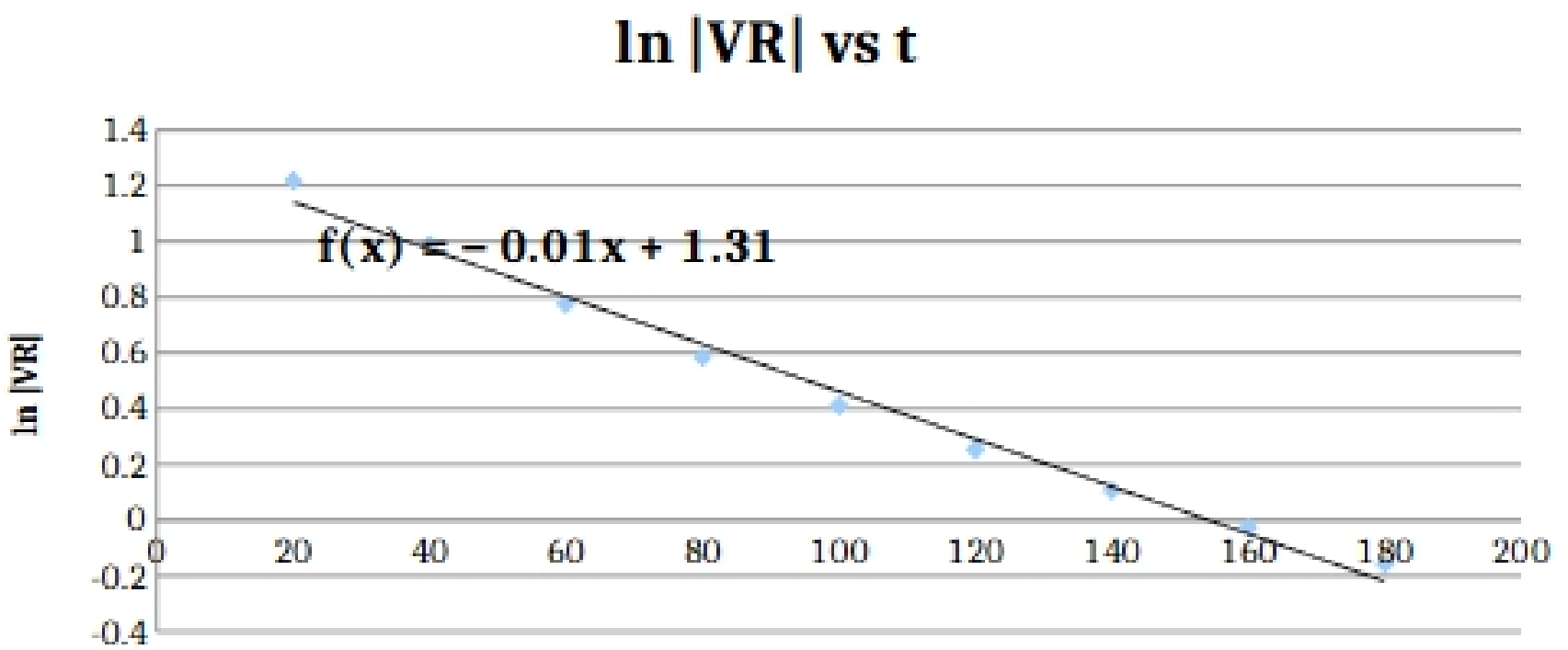
VI-1

t (s)	|VR| (volts)	ln |VR|
20	3.384	1.219058442
40	2.687	0.98842533
60	2.173	0.776108701
80	1.794	0.584447764
100	1.509	0.41144718
120	1.288	0.253090628
140	1.112	0.106160196
160	0.973	-0.027371197
180	0.854	-0.157824085



Using the LINEST function in EXCEL, the slope s and its uncertainty were determined as follows:

Slope s (s^{-1})	-0.008521812	1.313685926	Intercept b
σ_s	0.000322683	0.036316746	σ_b

The plot has a slope $s=-1/\tau$, where τ is in seconds.

Therefore, $\tau = \frac{-1}{-0.008521812} = 117.3459 s$

$$\sigma_\tau = \sqrt{\left(\frac{1}{s^2}\right)^2 (\sigma_s)^2}$$

$$-0.008521812$$

$$i$$

$$i$$

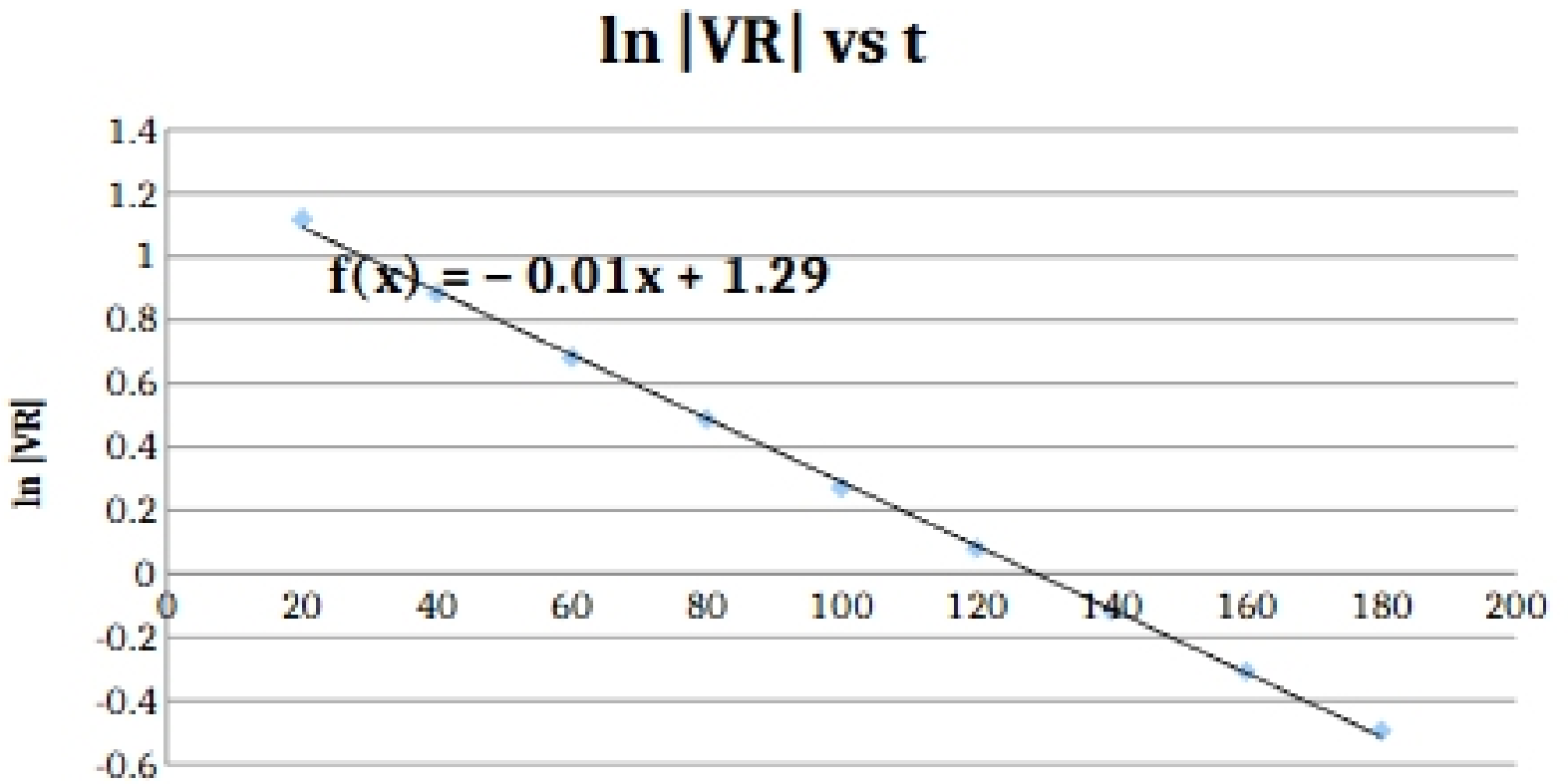
$$\sigma_\tau = \frac{\sigma_s}{s^2} = 0.000322683/i$$

$$\sigma_\tau = 4.44 s$$

$$\tau \pm \sigma_\tau = 117 \pm 4 s$$

VI-2

t (s)	|VR| (volts)	ln |VR|
20	3.059	1.118088065
40	2.421	0.884180678
60	1.978	0.682086233
80	1.629	0.48796633
100	1.312	0.271552691
120	1.082	0.07881118
140	0.89	-0.116533816
160	0.735	-0.30788478
180	0.609	-0.495937011



Using the LINEST function in EXCEL, the slope s and its uncertainty were determined as follows:

Slope s (s^{-1})	-0.010032243	1.292372057	Intercept b
σ_s	9.66247E-05	0.010874753	σ_b

The plot has a slope $s=-1/\tau$, where τ is in seconds.

Therefore, $\tau=\dfrac{-1}{-0.010032243}=99.6786\,s$

$$\sigma_\tau=\sqrt{\left(\frac{1}{s^2}\right)^2(\sigma_s)^2}$$

-0.010032243

¿

¿

$$\sigma_\tau=\frac{\sigma_s}{s^2}=9.66247\text{E-}05/¿$$

$$\sigma_\tau=0.96\,s$$

$$\tau\pm\sigma_\tau=100\pm1\,s$$

No, we can clearly deduce that the time constant determined by charging and the time constant determined by discharging do not agree with each other.