

Homework 13

Due Thursday, March 27th in class

Some questions and calculations to practice your handling of RC Circuit data.

You can use the graph paper on the back of the sheet for Problems 1 & 2.

The data in the table below give a set of measurements of time and Voltage to use.

1. Plot the graph of V vs. t to see the exponential curve.
2. Plot the graph of $\ln(V)$ vs. t . It should look linear.
3. Find the best fit line for these data and the slope of that line.
4. For this graph, we know that $slope = -1/\tau$. Find the time constant, τ .
5. If the resistance is $R = 1.50 \text{ k}\Omega$, find the capacitance C (include proper units).

$\Delta t(\mu s)$	$V(\text{Volts})$	$\ln(V)$
-320	20.2	3.01
-300	15.9	2.70
-280	11.2	2.42
-260	8.2	2.10
-240	6.0	1.79
-220	4.4	1.48
-200	3.4	1.22
-180	2.4	0.88