
LAB 5 PRE-LAB

1. The voltage of a capacitor while discharging through a resistor is modeled by the equation

$$V = V_0 e^{-t/RC}$$

Identify each of the quantities represented by the symbols in the formula.

V : _____ V_0 : _____

e : _____ t : _____

R : _____ C : _____

2. Transform the discharge equation by taking the natural logarithm of both sides. Two rules of logarithms will be useful for your algebra: For any numbers a and b , $\ln(a \cdot b) = \ln a + \ln b$, and $\ln e^a = a$. Simplify the result below.

$$V = V_0 e^{-t/RC}$$

$$\ln V = \ln(V_0 \cdot e^{-t/RC})$$

3. An equation of the type $y = mx + b$, when graphed as a y - x plot (y along the vertical axis and x along the horizontal axis), makes a straight line.

A. What does the m in the equation tell you about the graph? _____

B. What does the b in the equation tell you about the graph? _____

4. When charging a capacitor that is wired in series with a resistor, the voltage across the capacitor increases with time, while the voltage across the resistor decreases with time. Explain.

