Part 1: 100KΩ resistor and 10 μF capacitor, 5V DC

Fully charged voltage: $V(t=\infty) = 4.49\ V$

General form of equation: $V(t) = V(\infty) * (1 - e^{-t/\tau}) = 4.49 * (1 - e^{-t/\tau})$

Solving for Voltage: $V(\tau) = V(\infty) * (1 - e^{-1}) = 4.49 * (1 - 1/e) = 2.838\ V$

According to the graph, when $\Delta V = 2.838\ V$, $\Delta X = 1.021\ seconds$

Final output equation: $V(t) = 4.49 * (1 - e^{-t/1.021})$