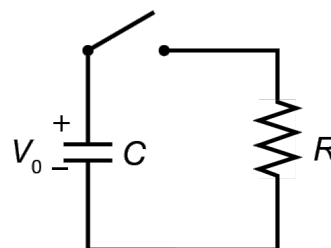

RC Circuits

1. Suppose a capacitor is charged to voltage V_0 and connected in series to a resistor and an open switch. At time $t = 0$, the switch is closed, allowing the charges on the plates of the capacitor to flow through the circuit and come to equilibrium. Sketch below graphs showing what you expect for:

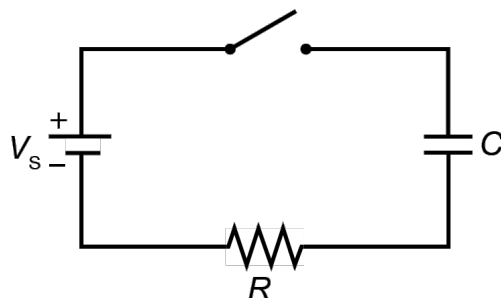


a. The voltage across the capacitor as a function of time

b. The charge on the capacitor as a function of time

c. The current through the resistor as a function of time

2. Suppose a discharged capacitor is placed in series with a DC voltage source, a resistor, and a switch. The switch is closed at time $t = 0$. Sketch below graphs showing what you expect for:



a. The voltage across the capacitor as a function of time

- b. The charge on the capacitor as a function of time
 - c. The current through the resistor as a function of time
 - d. The voltage across the resistor as a function of time
3. Given our solution of the function for voltage of the discharging capacitor (Question 1), find the functions for charge and current.
4. Given our solution of the function for voltage of the charging capacitor (Question 2), find the functions for current in the circuit, charge of the capacitor, and voltage of the resistor.