

Physics 321: HW 3

Problems 2.20, 2.21, 3.2, 3.4, 3.6, 3.9, and 3.11 in Sprott. In problem 3.11, also calculate $V_R(t)$ — the voltage across R — assuming the switch is closed at $t = 0$.

hints:

3.9 To get this circuit into a simpler form that you've already solved, consider replacing part of it with a Thevenin equivalent

3.11 Since sums of solutions to a linear problem are also a solution, you can solve for changes independent of initial conditions: just add the changes to the initial conditions. Changes in the charges (Q) on C_1 and C_2 will always be the same since the capacitors are in series and will have the same currents through them (even though they apparently were not when they were initially charged). So you can combine them into a single capacitor to simplify the circuit for calculating the time-dependence.