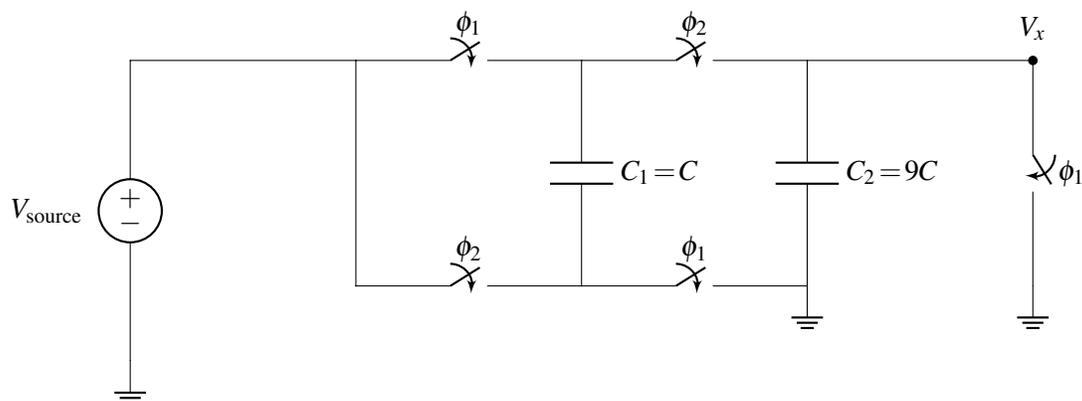

EECS 16A Designing Information Devices and Systems I Discussion 9B
 Spring 2022

1. Charge Sharing

Consider the following circuit:



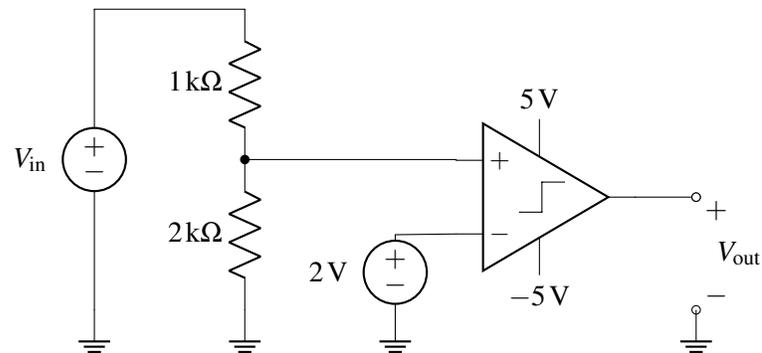
In the first phase, all of the switches labeled ϕ_1 will be closed and all switches labeled ϕ_2 will be open. In the second phase, all switches labeled ϕ_1 are opened and all switches labeled ϕ_2 are closed.

- Draw the polarity of the voltage (using + and - signs) across the two capacitors C_1 and C_2 . (It doesn't matter which terminal you label + or -; just remember to keep these consistent through phase 1 and 2!)
- Draw the circuit in the first phase and in the second phase. Keep your polarity from part (a) in mind.
- Find the voltages and charges on C_1 and C_2 in phase 1. Be sure to keep the polarities of the voltages the same!
- Now, in the second phase, find the voltage V_x .
- Practice Problem:** If the capacitor C_2 did not exist (i.e. had a capacitance of 0F), what would the voltage V_x be?

2. Comparators

For each of the circuits shown below, plot V_{out} for V_{in} ranging from -10V to 10V for part (a) and from 0V to 10V for part (b).

(a)



(b) **Practice**

