Consider a switched RC circuit as shown below. Suppose the switch is initially in position a. At time t = 0, the switch is instantaneously moved to position b. The initial voltage on the capacitor is the same as that of the battery for all time t ≤ 0.

Just as was done in the lecture, let's use a 12 V battery and an 8 μF capacitor. Let's change the value of the resistor to 200 kΩ. Answer the following questions.

(a) What is the value of the time constant (τ) of the circuit?

(b) Find an expression for the capacitor voltage V_C.

(c) Sketch a plot of the capacitor voltage as a function of time.

(d) Compare and contrast this plot to the one that was presented in class.