This print-out should have 8 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering. The due time is Central time.

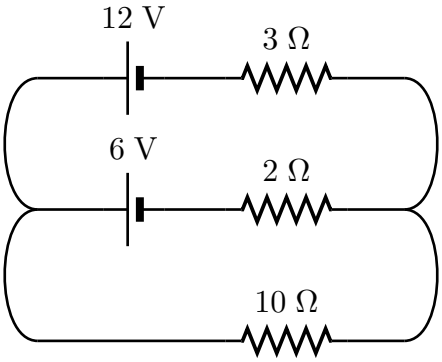
Please notice that for your homework to be considered towards your grade, it needs to be submitted one hour before the corresponding recitation starts. Work submitted after this time, but before the DUE DATE on top of this page, will be accepted but not graded.

PLEASE REMEMBER THAT YOU MUST CARRY OUT YOUR CALCULATIONS TO AT LEAST THREE SIGNIFICANT FIGURES. YOUR ANSWER MUST BE WITHIN ONE PERCENT OF THE CORRECT RESULT TO BE MARKED AS CORRECT BY THE SERVER.

Parallel Circuit 01

28:06, trigonometry, numeric, > 1 min, normal.

001



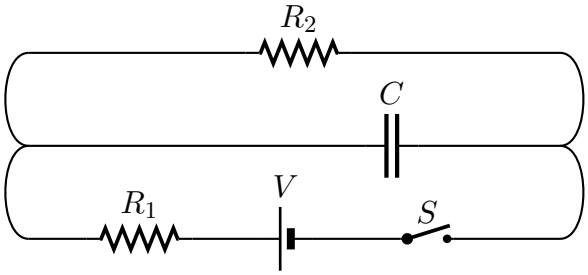
Find the current through the 10 Ω lower-right resistor. Answer in units of A.

AP EM 1993 MC 57 58

28:07, trigonometry, multiple choice, < 1 min, fixed.

002

The switch has been open for a long period of time.



Immediately after the switch is closed, the current supplied by the battery is

1. $I_0 = \dfrac{V}{R_1 + R_2}$.

2. $I_0 = \dfrac{V}{R_1}$.

3. $I_0 = \dfrac{V}{R_2}$.

4. $I_0 = \dfrac{V\,(R_1 + R_2)}{R_1\,R_2}$.

5. $I_0 = 0$.

003

A long time after the switch has been closed, the current I_∞ supplied by the battery is

1. $I_\infty = \dfrac{V}{R_1 + R_2}$.

2. $I_\infty = \dfrac{V}{R_1}$.

3. $I_\infty = \dfrac{V}{R_2}$.

4. $I_\infty = \dfrac{V\,(R_1 + R_2)}{R_1\,R_2}$.

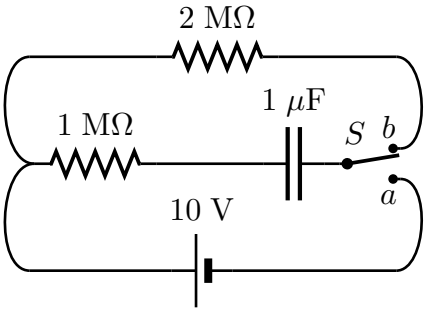
5. $I_\infty = 0$.

RC Circuit 04

28:07, trigonometry, numeric, > 1 min, normal.

004

For a long period of time the switch S is in position "b". At $t = 0$ s, the switch S is moved from position "b" to position "a".



Find the voltage across the 1 MΩ center-left resistor at time $t_1 = 2$ s. Answer in units of V.

005

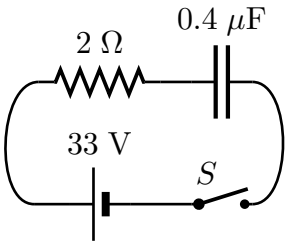
Much later, at some time $t_0' = 0$ s, the switch is moved from position "a" to position "b".

Find the voltage across the 1 MΩ center-left resistor at time $t' = 1$ s. Answer in units of V.

Series RC Circuit 05

28:07, trigonometry, numeric, > 1 min, normal.

006



How long after the switch is closed does the voltage across the resistor drop to $V_f = 16$ V? Answer in units of s.

007

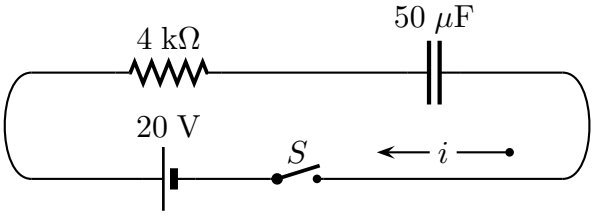
What is the charge on the capacitor at this time? Answer in units of C.

Series RC Circuit 13

28:07, trigonometry, numeric, > 1 min, normal.

008

At t=0 the switch S is closed with the capacitor is uncharged.



What is the charge on the capacitor when $I = 2$ mA? Answer in units of C.