EE 210: Circuits I
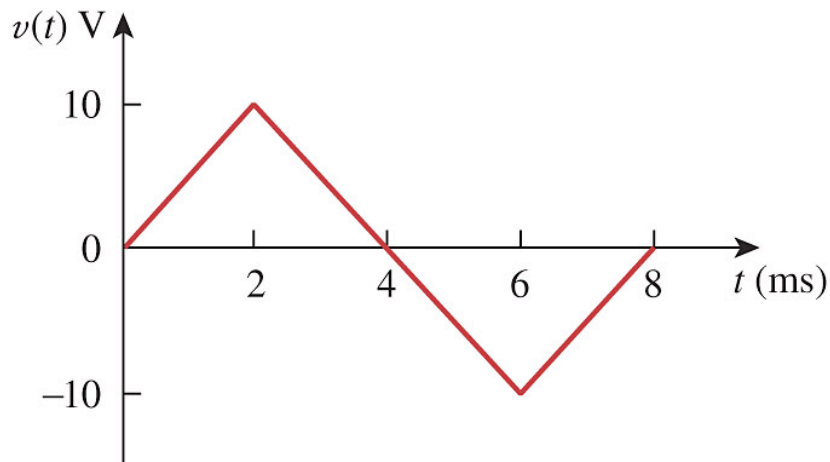Spring 2017   Due Date: Wed. 3/15/2017

Problem 1.

If the voltage across a 5-F capacitor is $2te^{-3t}$ V, find the current and the power.

Problem 2.
  The voltage across a 4-µF capacitor is shown. Find the current waveform.
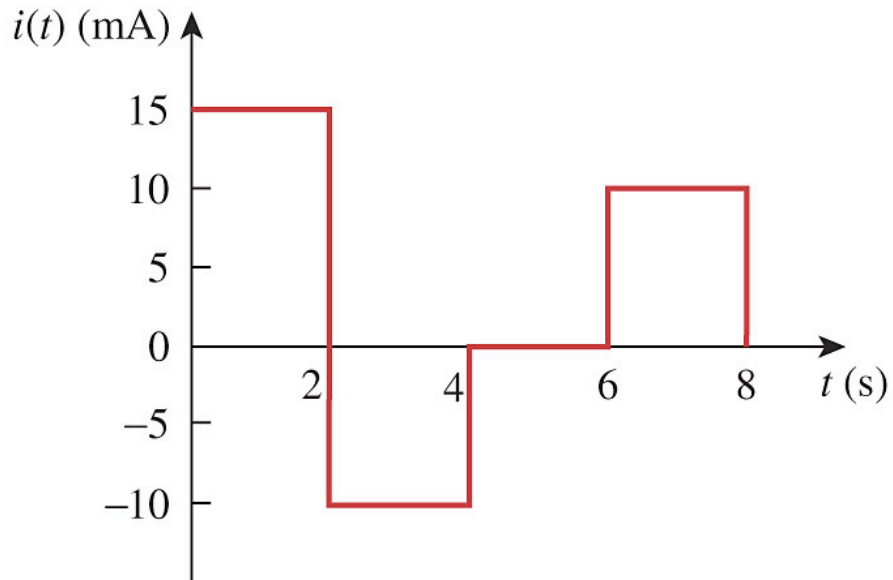

Problem 3.

At $t=0$, the voltage across a 50-mF capacitor is 10 V. Calculate
the voltage across the capacitor for $t > 0$ when current $4t$ mA flows
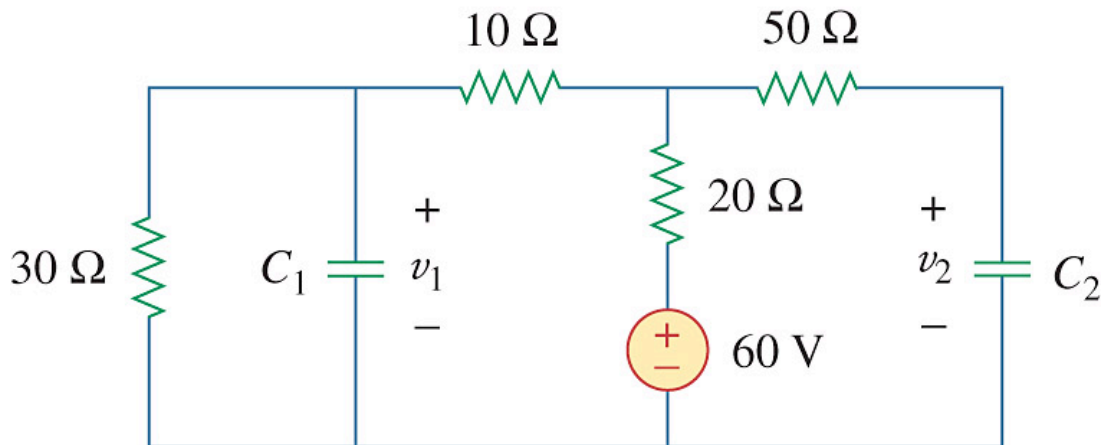through it.

Problem 4

A 4-mF capacitor has the current waveform shown in Fig. 6.48. Assuming that v(0)=10V, sketch the voltage waveform v(t).
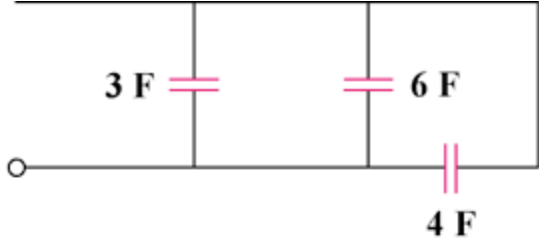

Problem 5

Find the voltage across the capacitors in the circuit below under dc conditions.
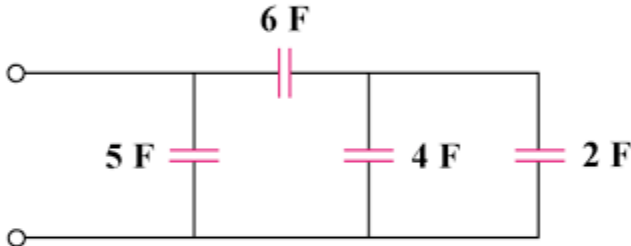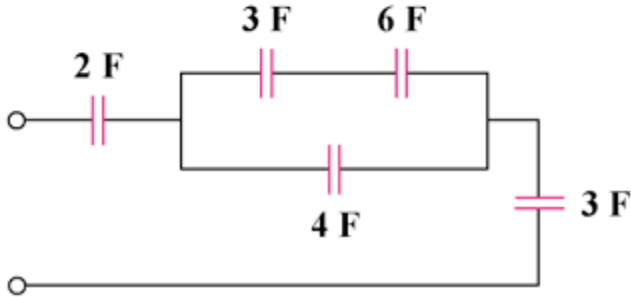
Problem 6

Determine the equivalent capacitance for each of the circuits below
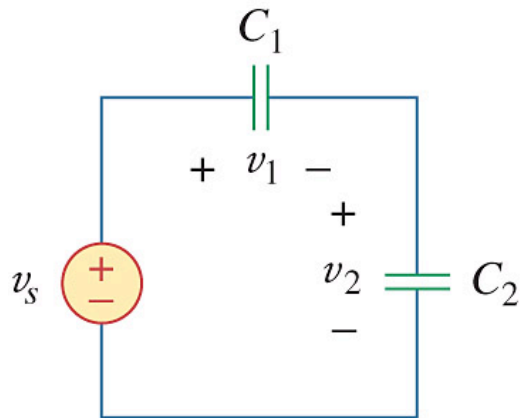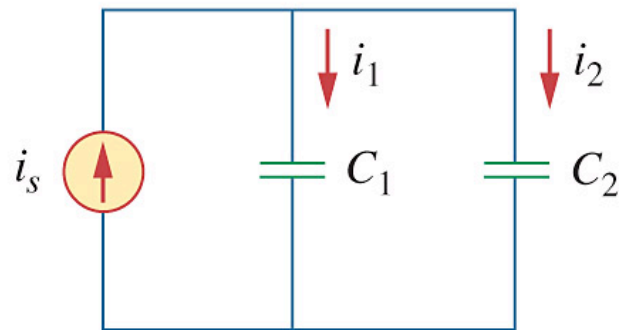

(a)

(b)

Problem 7

(a) Show that the voltage-division rule for two capacitors in series as shown is

$$v_1 = \frac{C_2}{C_1 + C_2} v_s , \qquad v_2 = \frac{C_1}{C_1 + C_2} v_s$$

assuming that the initial conditions are zero.

(a)

(b)

(b) For two capacitors in parallel as drawn, show that the current-division rule is

$$i_1 = \frac{C_1}{C_1 + C_2} i_s , \qquad i_2 = \frac{C_2}{C_1 + C_2} i_s$$

assuming that the initial conditions are zero.