Problem 5.10 The voltage $v(t)$ across a 20-μF capacitor is given by the waveform shown in Fig. P5.10.

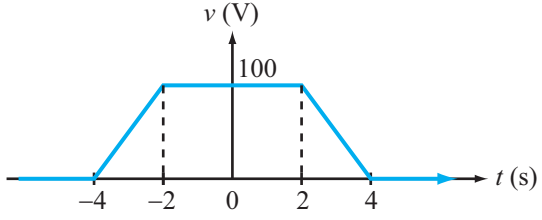


Figure P5.10: Waveform for Problem 5.10.

(a) Determine and plot the corresponding current $i(t)$.

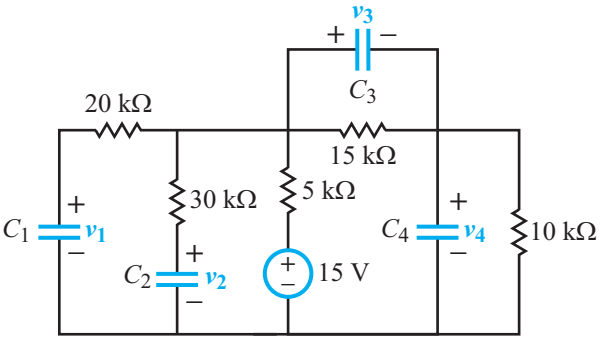
(b) Specify the time interval(s) during which power transfers into the capacitor and that (those) during which it transfers out of the capacitor.

(c) At what instant in time is the power transfer into the capacitor a maximum? And at what instant is the power transfer out of the capacitor a maximum?

(d) What is the maximum amount of energy stored in the capacitor, and when does it occur?

Problem 5.14 Determine voltage v_1 to v_4 in the circuit of Fig. P5.14 under dc conditions.

(a)



(b) Under dc conditions

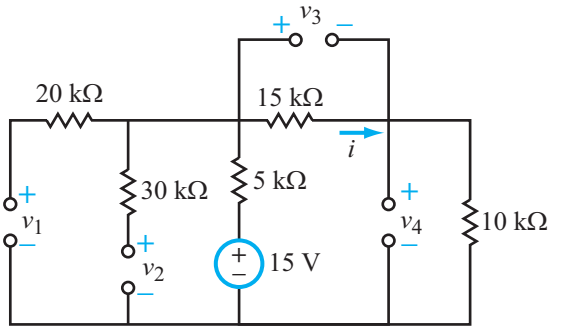
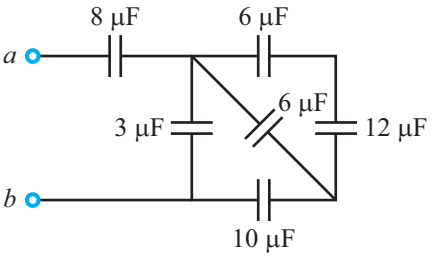


Figure P5.14: Circuit for Problem 5.14.

Problem 5.17 Reduce the circuit in Fig. P5.17 into a single equivalent capacitor at terminals (a, b). Assume that all initial voltages are zero at $t = 0$.

Solution:



Problem 5.24 The current $i(t)$ passing through a 0.1-mH inductor is given by the waveform shown in Fig. P5.24.

(a) Determine and plot the corresponding voltage $v(t)$ across the inductor.

(b) Specify the time interval(s) during which power is transferred into the inductor and that (those) during which power transfers out of the inductor. Also specify the amount of energy transferred in each case.

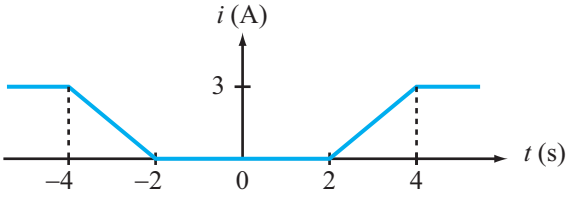
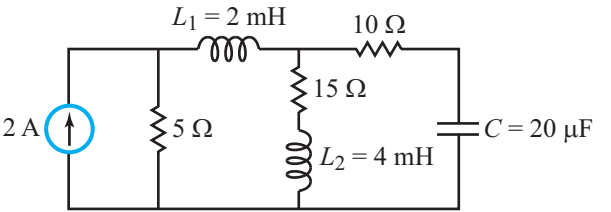


Figure P5.24: Circuit for Problem 5.24.

Problem 5.28 For the circuit in Fig. P5.28, determine the voltage across C and the currents through L_1 and L_2 under dc conditions.

Solution:



Problem 5.31 The values of all inductors in the circuit of Fig. P5.31 are in millihenrys. Determine L_{eq}.

Solution: