

Important Remarks

- Homework is due on April 17 at the beginning of class.
1. Problem 8.39
 2. Problem 9.2
 3. Problem 9.3
 4. Problem 9.12

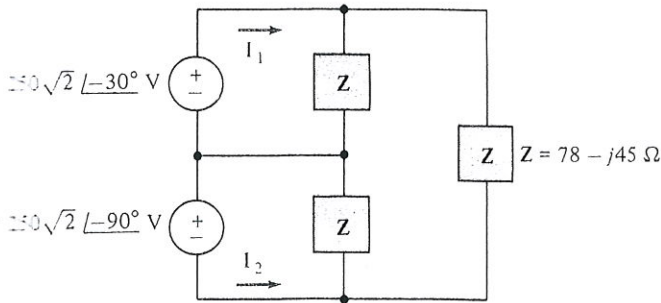


Fig. P8.39

- 8.38 For the circuit given in Fig. P8.29, change the value of the inductor to $\frac{1}{5}$ H. Find $v_o(t)$ by first replacing the portion of the circuit to the left of the $1\text{-}\Omega$ resistor with its Thévenin equivalent.
- 8.39 For the circuit shown in Fig. P8.39, find the (phasor) currents I_1 and I_2 .
- 8.40 For the circuit shown in Fig. P8.40, find the (phasor) currents I_1 and I_2 .
- 8.41 For the circuit shown in Fig. P8.41, find

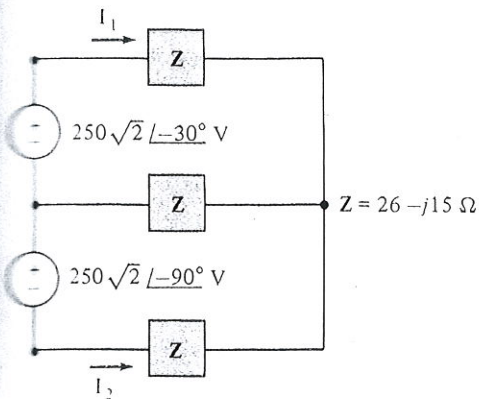


Fig. P8.40

- (a) $v_o(t)$, and (b) the impedance seen by the current source.

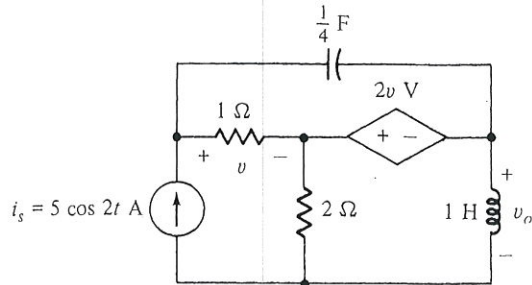


Fig. P8.41

- 8.42 For the circuit shown in Fig. P8.42, find (a) $v(t)$, and (b) the impedance seen by the voltage source.
- 8.43 Find the impedance seen by the independent voltage source for the circuit given in (a) Fig. 8.31 (p. 381), (b) Fig. DE8.12 (p. 382), (c) Fig. 8.32 (p. 382), and (d) Fig. DE8.13 (p. 383).
- 8.44 For the op-amp circuit shown in Fig. P8.44, find $v_o(t)$.

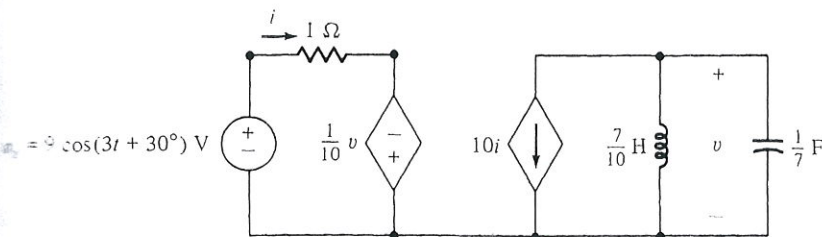


Fig. P8.42

10. Average or real power can be generalized with the notion of complex power.
11. The ordinary household uses a single-phase, three-wire electric system.
12. The most common polyphase electric system is the balanced three-phase system.
13. Three-phase sources are generally Y-connected, and three-phase loads are generally Δ -connected.
14. The device commonly used to measure power is the wattmeter.
15. Three-phase load power measurements can be taken with the two-wattmeter method.

● PROBLEMS FOR CHAPTER 9

- 9.1 For the RLC circuit shown in Fig. P9.1, find the average power absorbed by the $4\text{-}\Omega$ load resistor for the case that (a) $C = \frac{1}{6}\text{ F}$, (b) $C = \frac{1}{18}\text{ F}$, and (c) $C = \frac{1}{30}\text{ F}$.

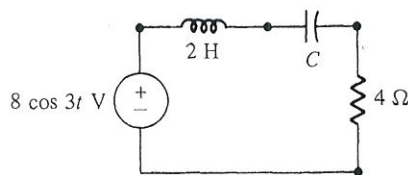


Fig. P9.1

- 9.2 For the circuit shown in Fig. P9.2, find the average power absorbed by each element for the case that $Z_L = 4\ \Omega$.

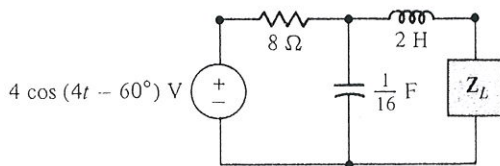


Fig. P9.2

- 9.3 For the circuit given in Fig. P9.2, (a) determine the load Z_L which absorbs maximum power, and find this power; and (b) determine the load R_L which absorbs maximum power for resistive loads, and find this power.

- 9.4 For the circuit shown in Fig. P9.4, find the average power absorbed by each element for the case that $Z_L = 1\ \Omega$.

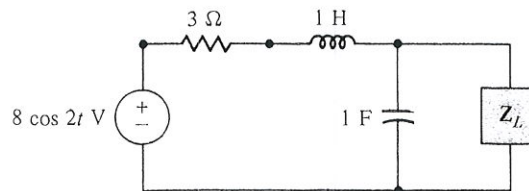


Fig. P9.4

- 9.5 Repeat Problem 9.3 for the circuit given in Fig. P9.4.
- 9.6 Find the average power absorbed by each element in the op-amp circuit given in Fig. P8.44 (p. 390).
- 9.7 Find the average power absorbed by each element in the op-amp circuit given in Fig. P8.45 (p. 390).
- 9.8 Find the average power absorbed by each element in the op-amp circuit given in Fig. P8.46 (p. 390).
- 9.9 For the circuit given in Fig. P8.39 (p. 389), (a) find the average power absorbed by each impedance and (b) find the average power supplied by each source.
- 9.10 For the circuit given in Fig. P8.40 (p. 389), (a) find the average power absorbed by each impedance and (b) find

the average power supplied by each source.

- 9.11 For the op-amp circuit shown in Fig. P9.11, the rms value of $v_s(t)$ is 1 V. Find the average power absorbed by each resistor.

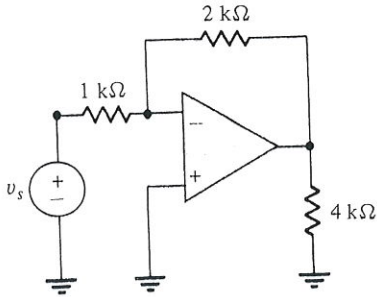


Fig. P9.11

- 9.12 For the op-amp circuit shown in Fig. P9.12, the rms value of $v_s(t)$ is 1 V. Find the average power absorbed by each resistor.

- 9.13 For the op-amp circuit given in Fig. P9.11, find the average power absorbed by each resistor when the input voltage $v_s(t)$ is as shown in Fig. P9.13.

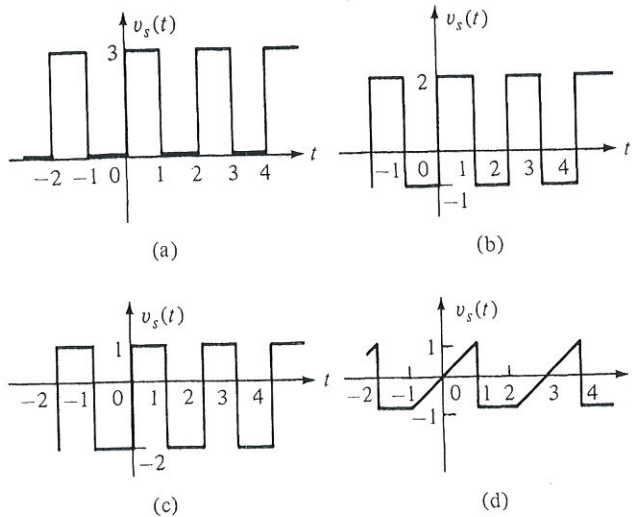


Fig. P9.13

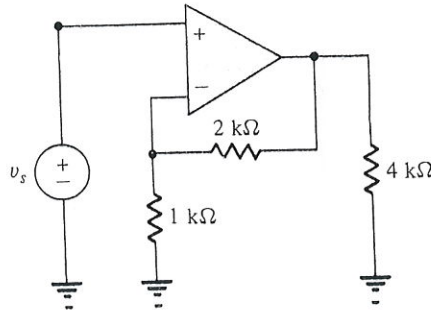


Fig. P9.12

- 9.14 For the op-amp circuit given in Fig. P9.12, find the average power absorbed by each resistor when the input voltage $v_s(t)$ is as shown in Fig. P9.13.

- 9.15 Find the rms values of the functions shown in Fig. P9.15.

- 9.16 Find the rms values of the "rectified" sine waves shown in Fig. P9.16. [Hint: $\sin^2 x = \frac{1}{2}(1 - \cos 2x)$.]

- 9.17 Figure P9.17(a) shows a BJT (common-emitter) amplifier. Suppose that the applied voltage $v_s(t)$ is described by Fig. P9.17(b). Find the average power absorbed by each resistor.

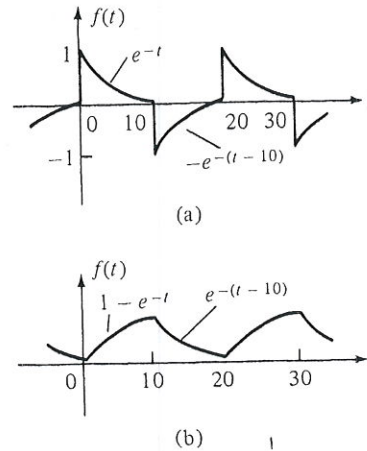


Fig. P9.15

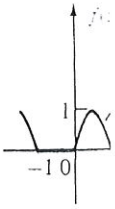


Fig. P9.16

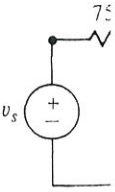


Fig. P9.17

- 9.18 Fig. P9.18 shows a basic amplifier circuit. Find the average power absorbed by each resistor.

- 9.19 A voltage source $v_s(t)$ is connected to a resistor R . Find the average power absorbed by the resistor when $v_s(t)$ is as shown in Fig. P9.19.

and

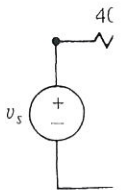


Fig. P9.18