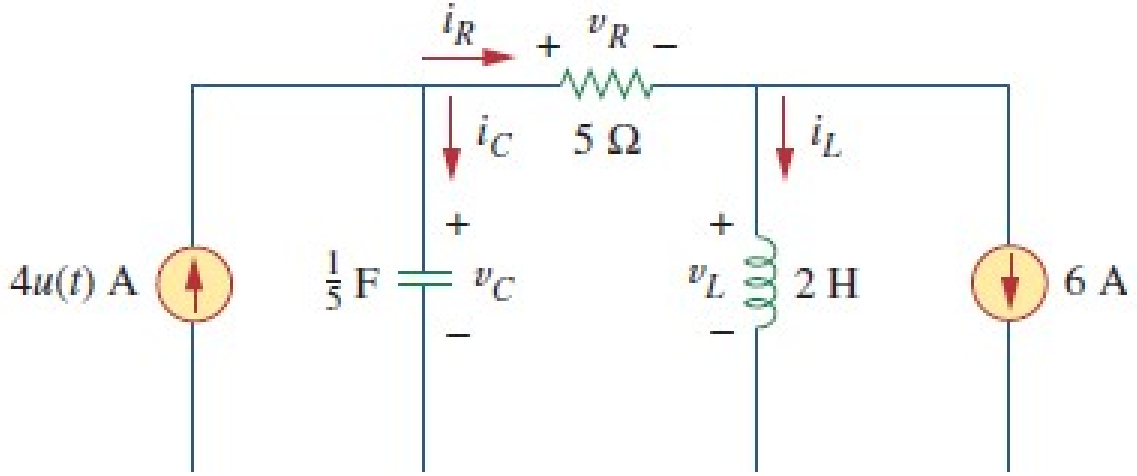
C8 problems

For the circuit in Fig. 8.7, find: (a) $i_L(0^+), v_C(0^+), v_R(0^+)$, (b) $di_L(0^+)/dt, dv_C(0^+)/dt, dv_R(0^+)/dt$, (c) $i_L(\infty), v_C(\infty), v_R(\infty)$.



Practice Problem 8.3

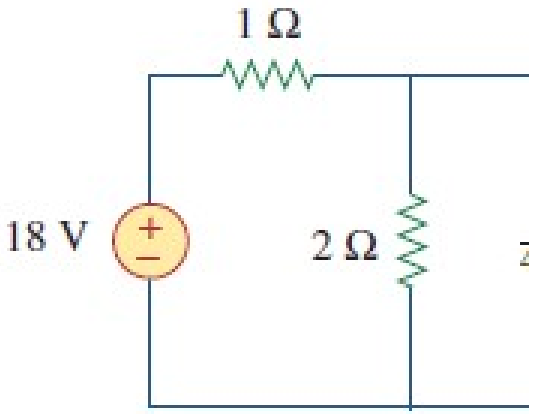
If $R = 10\ \Omega$, $L = 5$ H, and $C = 2$
What type of natural response wi

Refer to the circuit in Fig. 8.17. Find $v(t)$ for $t > 0$.

Answer: $150(e^{-10t} - e^{-2.5t})$ V.

Practice Problem 8.7

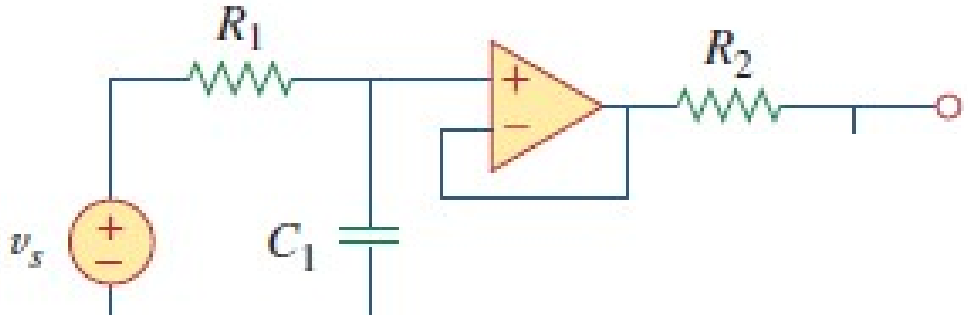
Having been in position a for a
moved to position b at $t = 0$. Fir



Determine v and i for $t > 0$ in the circuit of Fig. 8.28. (See comments about current sources in Practice Prob. 7.5.)

Answer: $12(1 - e^{-5t})$ V, $3(1 - e^{-5t})$ A.

Practice Problem 8.11



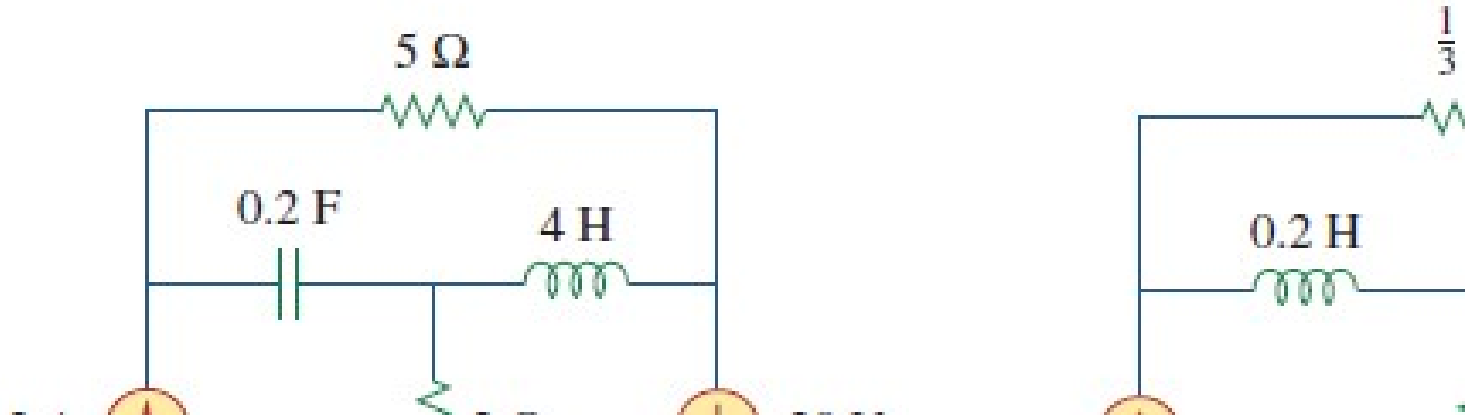
In the op amp circuit shown in F
$t > 0$. Assume that $R_1 = R_2 = 1($

Answer: $(10 - 12.5e^{-t} + 2.5e^{-5}$

Practice Problem 8.15

For the circuit in Fig. 8.50, obtai

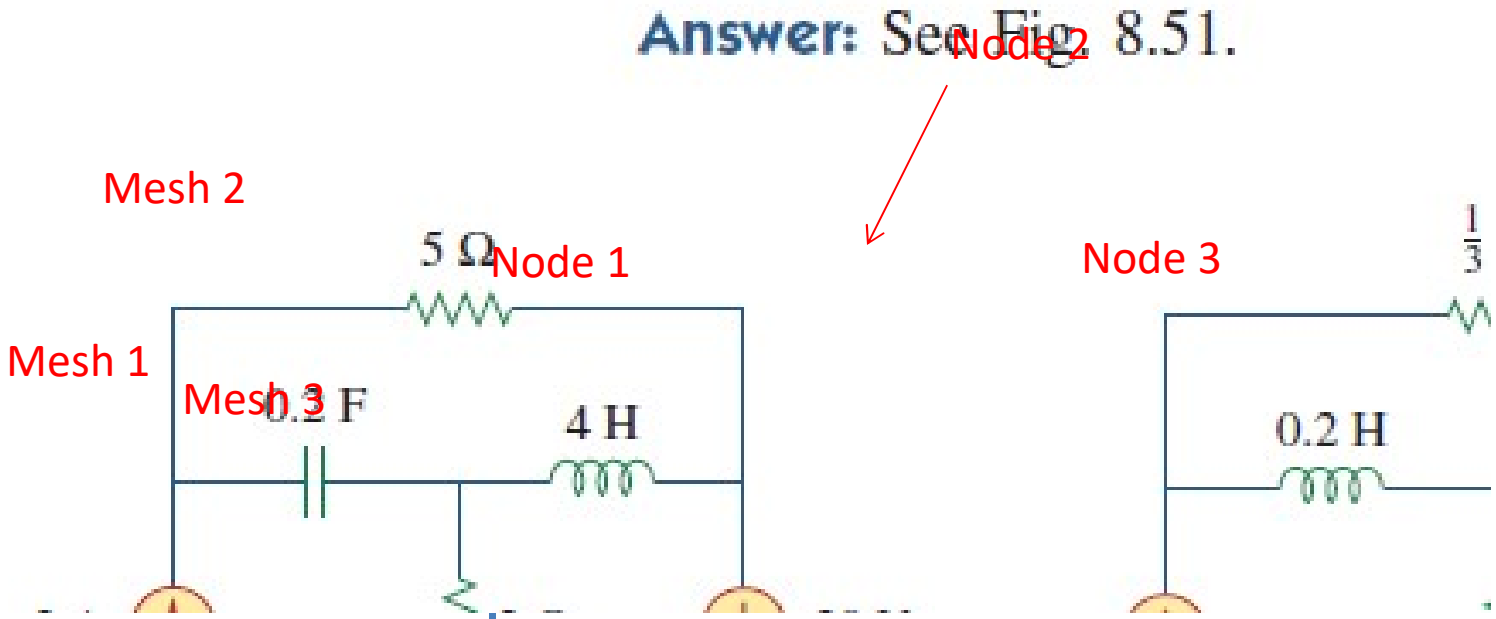
Answer: See Fig. 8.51.



Practice Problem 8.15

For the circuit in Fig. 8.50, obtai

Answer: See Fig. 8.51.



Mesh eq. for mesh 2:

$5i_2 + 4d(i_2-i_3)/dt + 1/0.2\int(i_2-i_1)dt=0$

Clockwise direction

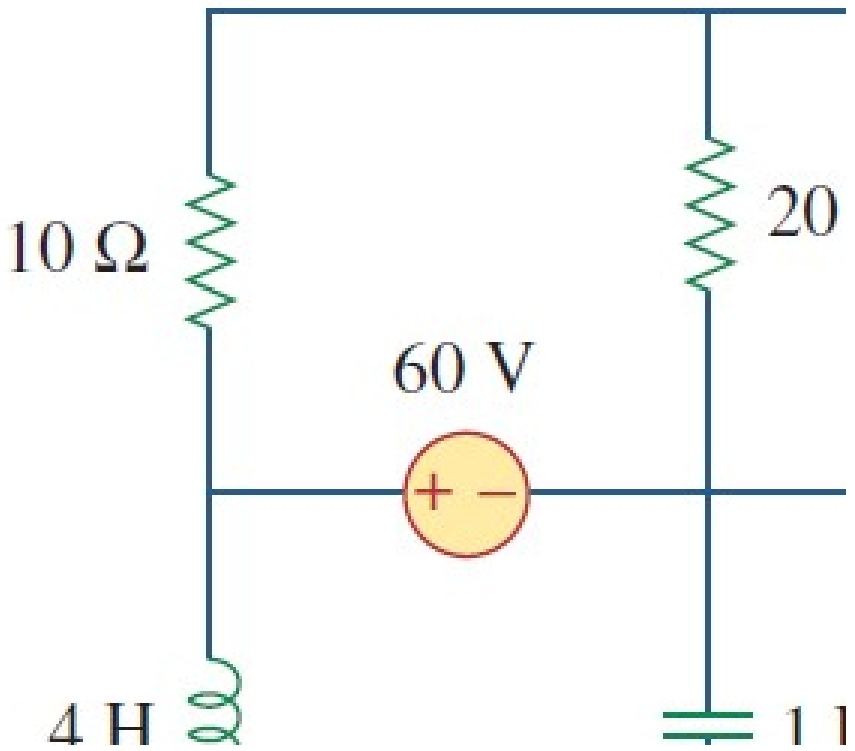
Node eq. for node 2:

$5v_2 + 4d(v_2-v_3)/dt + 1/0.2\int(v_2-v_1)dt=0$

Leaving currents

Comparison of mesh eq. and nodal eq. in original and dual circuits:
By replacing i with v, we get totally same equations.

8.76 Find the dual of the circuit



Mesh eq. 1: … … −60V … … = 0

Node eq. 1: … … −60A … … = 0

Leaving node 1 with −60A
→ Entering node 1 with 60A

- 8.2 (s8.2)
- 8.3 (s8.3)
- 8.6 (s8.4)
- 8.7 (s8.5)
- 8.9 (s8.7)
- 8.11 (s8.8)
- 8.15 (s8.10)