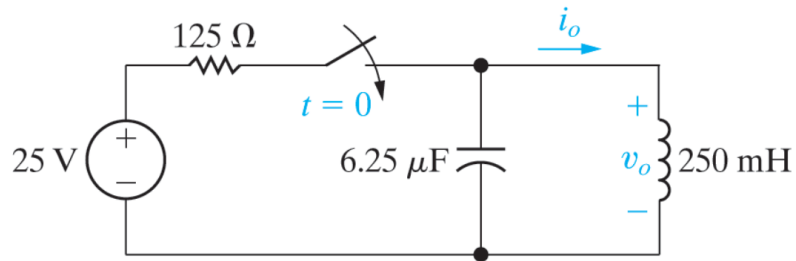


HW9: **Name:** _____

Lab Section: _____

8.30 PSPICE
MULTISIM There is no energy stored in the circuit in Fig. P8.30 when the switch is closed at $t = 0$. Find $i_o(t)$ for $t \geq 0$.

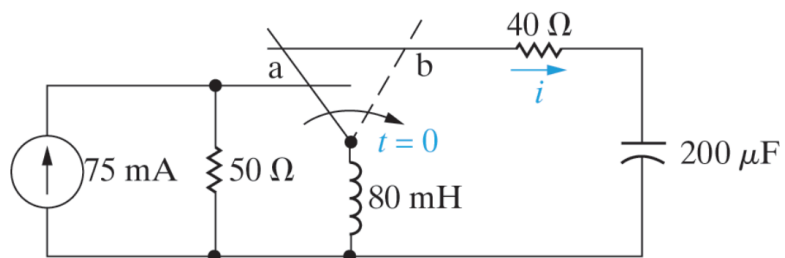
Figure P8.30



Hint: This is a parallel connection. You can use source transformation to convert the voltage source into current source.

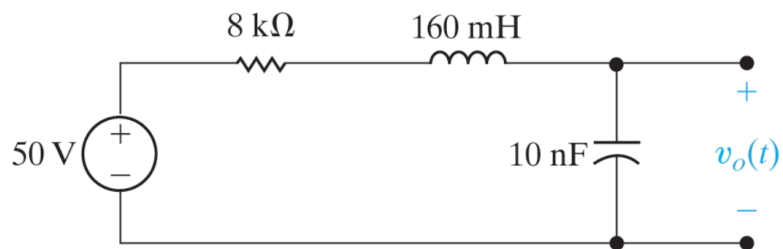
- 8.45 The switch in the circuit shown in Fig. P8.45 has been in position a for a long time. At $t = 0$, the switch is moved instantaneously to position b. Find $i(t)$ for $t \geq 0$.

Figure P8.45



- 8.49 PSPICE
MULTISIM The circuit shown in Fig. P8.49 has been in operation for a long time. At $t = 0$, the source voltage suddenly increases to 250 V. Find $v_o(t)$ for $t \geq 0$.

Figure P8.49



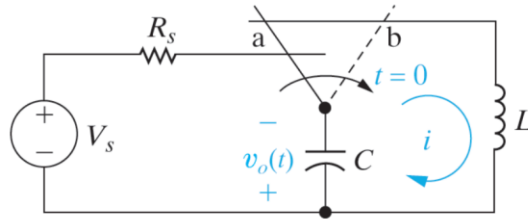
8.67

PRACTICAL
PERSPECTIVE

Consider the LC oscillator circuit in Fig. 8.22. Assume that $V = 4\text{ V}$, $R_s = 10\ \Omega$, and $L = 1\text{ nH}$.

- Calculate the value of capacitance, C , that will produce a sinusoidal output with a frequency of 2 GHz for $t \geq 0$.
- Write the expression for the output voltage, $v_o(t)$, for $t \geq 0$.

Figure 8.22 An LC natural response circuit.



Hint: 2GHz is in terms of f with unit Hz. The term ω , e.g., ω_o or ω_d , is with unit rad/s. You will need to convert between f and ω in order to make it right. Simply: $\omega = 2\pi f$

9.2 A sinusoidal voltage is given by the expression

$$v = 10 \cos (3769.91t - 53.13^\circ) \text{ V.}$$

Find (a) f in hertz; (b) T in milliseconds; (c) V_m ; (d) $v(0)$; (e) ϕ in degrees and radians; (f) the smallest positive value of t at which $v = 0$; and (g) the smallest positive value of t at which $dv/dt = 0$.