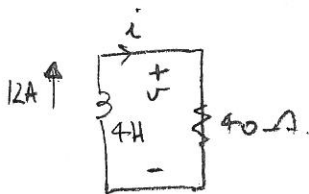
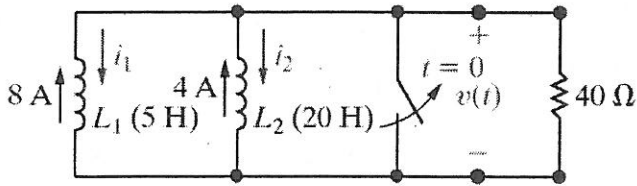


# SOLUTION

## ECE222

### Quiz 1

For the circuit below find an expression for the inductor current  $i_1, t \geq 0$ . (Show all your work).



$$\tau = \frac{L}{R} = \frac{4}{40} = 0.1$$

$$i(0) = 12$$

$$\Rightarrow i(t) = 12e^{-10t}, \quad t \geq 0$$

$$\Rightarrow v(t) = 40 \times 12e^{-10t}$$

$$v(t) = 480e^{-10t}, \quad t \geq 0^+$$

$$i_1 = \frac{1}{5} \int_0^t 480e^{-10x} dx - 8$$

$$= \frac{480}{5} \left[ \frac{-e^{-10x}}{10} \right]_0^t - 8$$

$$= -\frac{48}{5} [e^{-10t} - 1] - 8$$

$$= -\frac{48}{5}e^{-10t} + \frac{48}{5} - 8$$

$$i_1(t) = 1.6 - 9.6e^{-10t}, \quad t \geq 0$$