1. (§16.2) The current in an RLC circuit is described by

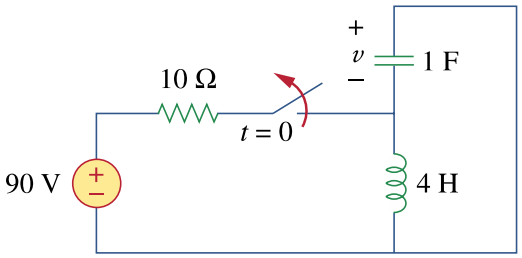
$$\frac{d^2i}{dt^2} + 10\frac{di}{dt} + 25i = 0$$

If $i(0) = 2$ and $di(0)/dt = 0$, find $i(t)$ for $t > 0$.

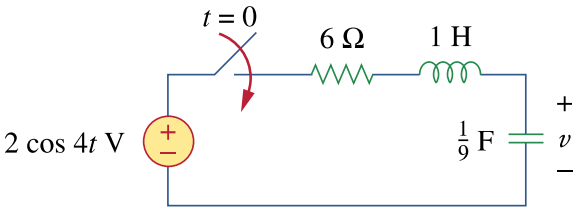
2. (§15.6) Use the Laplace transform to solve the following integrodifferential equation.

$$\frac{dy}{dt} + 4y + 3\int_0^t y\,dt = 6e^{-2t}, \qquad y(0) = -1$$

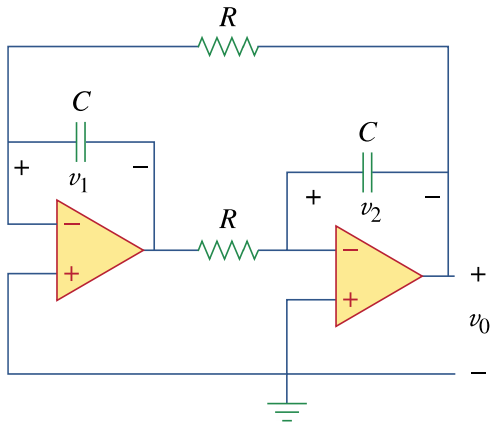
3. (§16.3) Obtain $v(t)$ for $t > 0$ for the circuit below. The switch is closed for a long time before $t = 0$, then opens at time $t = 0$. The 90 V source is DC.



4. (§16.3) For the RLC circuit shown below, find the complete response $v(t)$ if $v(0) = 2$ V when the switch is closed at $t = 0$.



5. (§16.3) Given the op amp circuit below, if $v_1(0^+) = 2$ V and $v_2(0^+) = 0$ V, find v_o for $t > 0$. Let $R = 100$ kΩ and $C = 1$ μF.



6. (§16.4) When the input to a system is a unit step function, the response is $10\cos 2tu(t)$. Obtain the transfer function of the system.

7. (§16.4) Obtain the transfer function $H(s) = V_o/V_s$ for the circuit below.