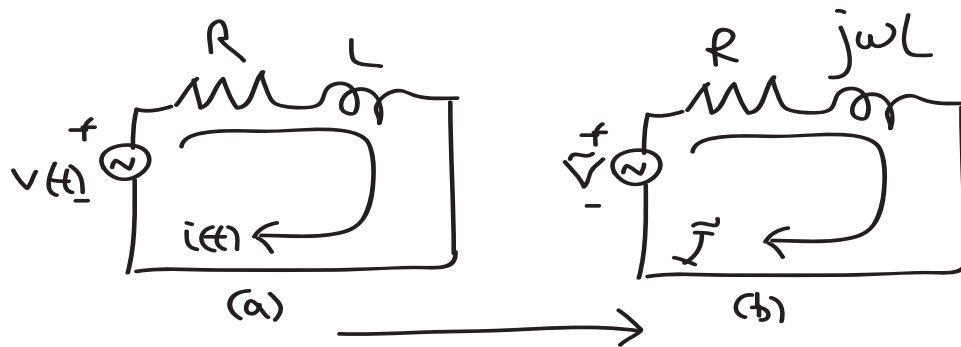


HOMEWORK NO. 1

Due: Thu. Sep. 8, 2011

1. Ch. 1, 1.1 complex numbers
2. Ch.1, 1.2 complex numbers

3. For the circuit shown below, do the following: Do the following:



- (i) Write the differential equation for the circuit in (a). Let $R=1$. $L=2$.
- (ii) Write the “steady-state assumption” for linear time-invariant systems. Show that the fact that you get the steady-state circuit (b) using the steady-state assumption. Now solve that for \tilde{I} and then for steady-state current $i(t)$ (using of course, the steady-state assumption).
- (iii) Assuming $v(t) = 3 \cos 60t$, zero initial condition ($i(0) = 0$), solve for the transient solution, the steady state solution and then the total solution $i(t)$.

4. Find the complex frequency s in each of the following signals:

$$e^{-2t}, \quad \cos(2\pi 60t), \quad e^{-2t} \cos(2\pi 60t), \quad e^{(-1+j2)t}.$$