

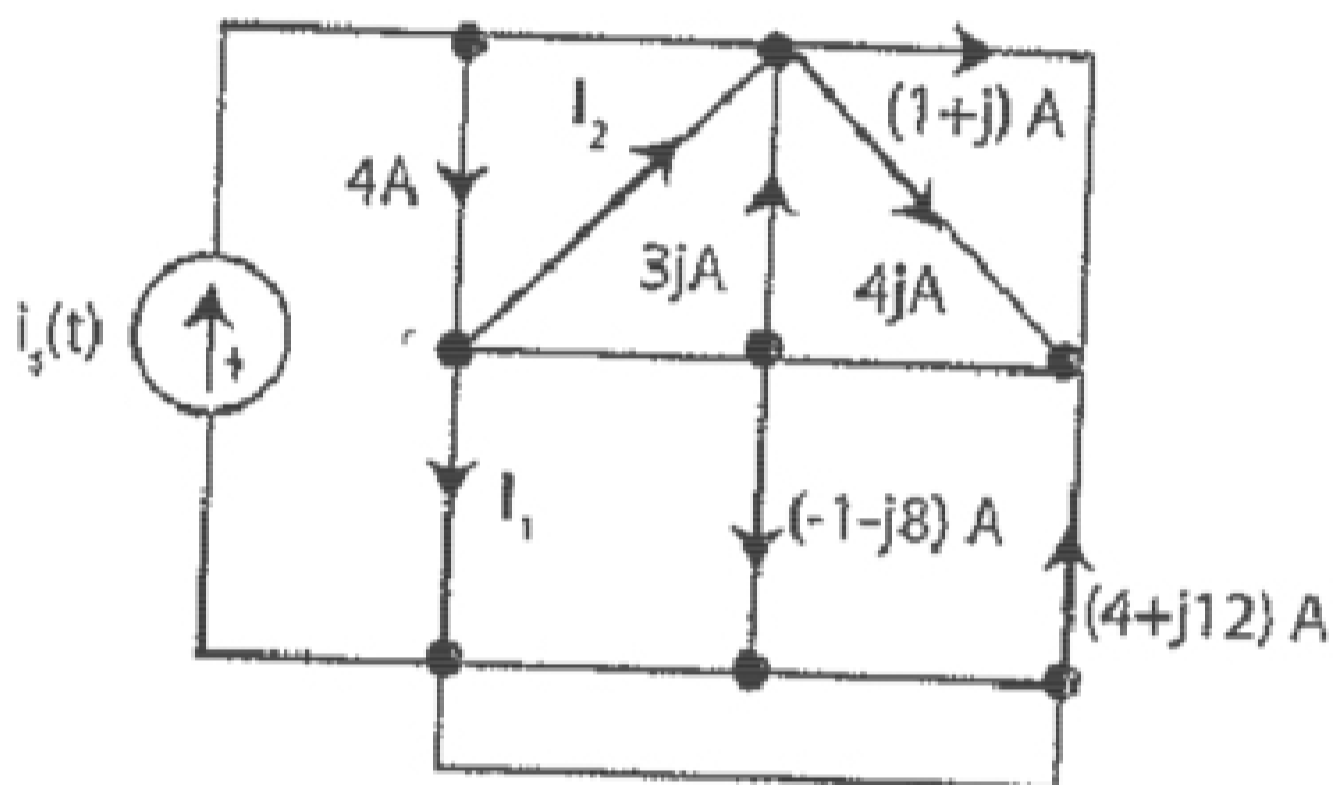
# Homework 31

ECE201: Linear Circuit Analysis

Due in class: Monday, November 14, 2011

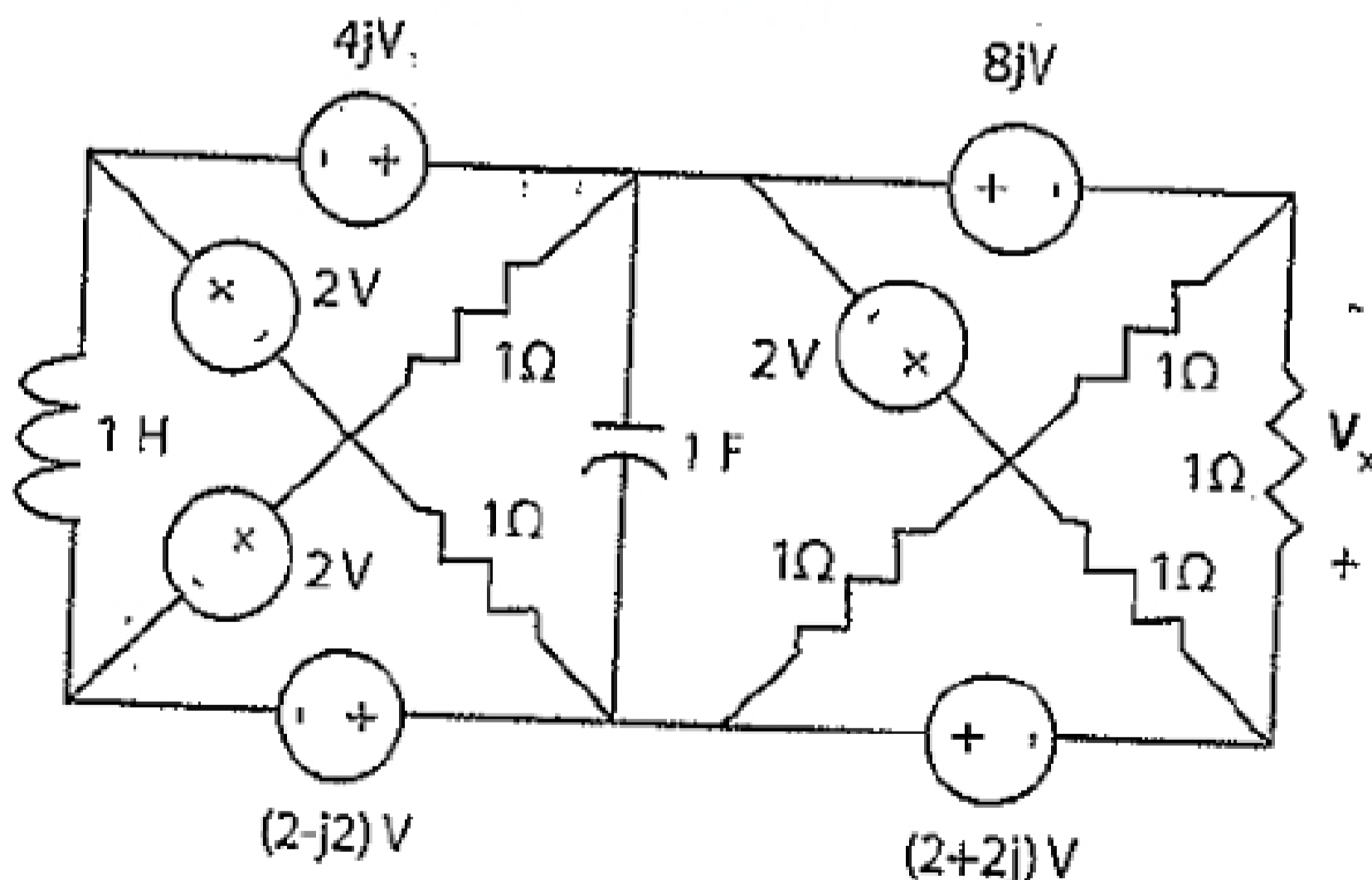
## Question 1

The circuit showing in the following figure operates in the sinusoidal steady state with the indicated phasor currents with  $i_3(t) = 10 \cos(1000t)$  A. Find the value of the phasor currents and the associated  $i_1(t)$  and  $i_2(t)$ .



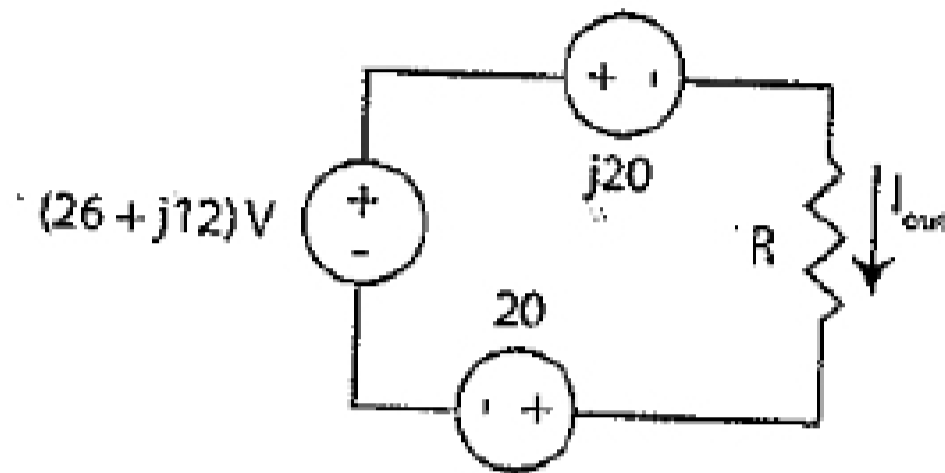
## Question 2

Use KVL to determine the phasor voltage  $V_x$  in the circuit below.

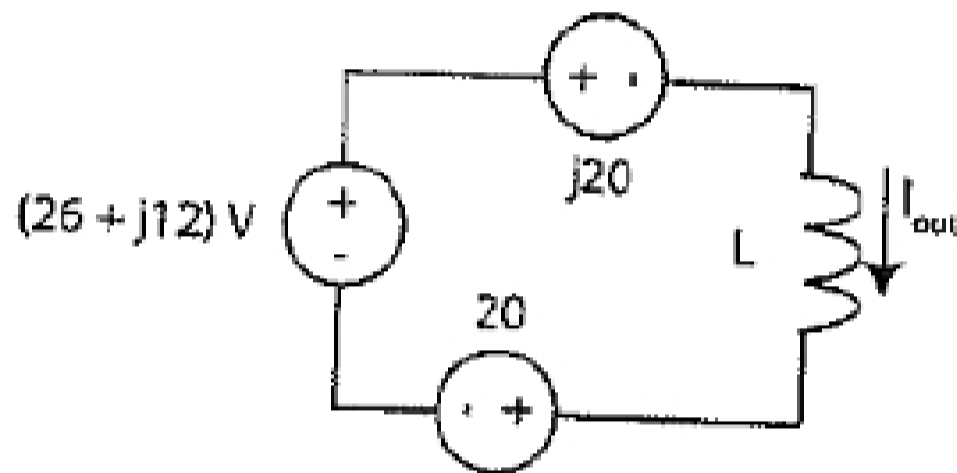


### Question 3

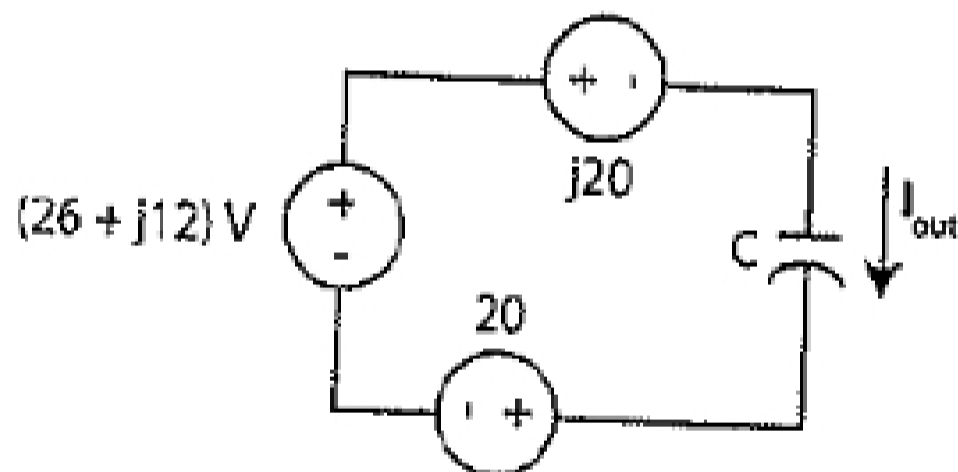
For the circuits in the following figure, compute the indicated phasor currents assuming  $R = 2 \Omega$  and  $L = 4 \text{ mH}$ , and  $C = 1 \text{ mF}$ . If  $\omega = 500 \text{ rad/sec}$ , determine the associated time function.



(a)



(b)



(c)

### Question 4

Find the phasor currents  $\mathbf{I}_R$ ,  $\mathbf{I}_C$ ,  $\mathbf{I}_L$ , and  $\mathbf{I}_{in}$ , and then determine  $i_{in}(t)$  for the circuit of the following figure in which  $R = 1 \text{ k}\Omega$ ,  $L = 0.5 \text{ H}$ ,  $C = 1 \mu\text{F}$ , and  $v_{in}(t) = 20 \cos(1000t + 60^\circ) \text{ V}$ .

