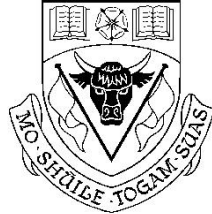


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Student Name or ID Number \_\_\_\_\_

Lecture Section: \_\_\_\_\_



UNIVERSITY OF  
CALGARY

FACULTY OF ENGINEERING

ENGG 325 - Electric Circuits and Systems

## Midterm Examination

Thursday, October 23, 2003

Time: 6:30 - 8:00 PM

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### Instructions:

- Time allowed is 90 minutes.
  - The examination is closed-book.
  - Non-programmable calculators are permitted.
  - The maximum number of marks is 100, as indicated; the midterm examination counts 20% toward the final grade.
  - Please use a pen or heavy pencil to ensure legibility.
  - Please answer questions in the spaces provided; if space is insufficient, please use the back of the pages.
  - Please show your work; marks will be awarded for proper and well-reasoned explanations.
-

Name: \_\_\_\_\_, ID: \_\_\_\_\_

1. Consider the circuit given in Fig. Q1. Find the current  $i_x$  in the circuit by applying the principle of superposition. [20 marks.]

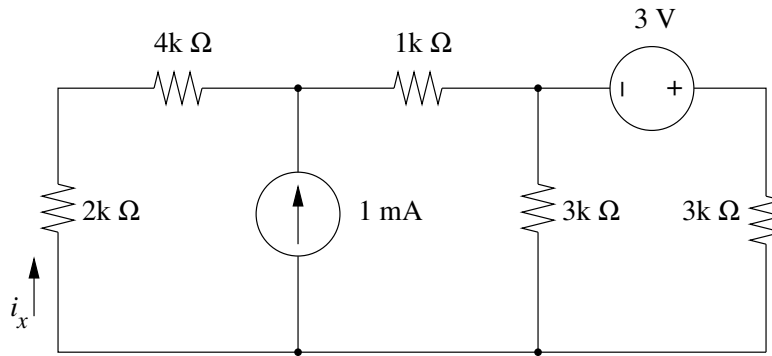
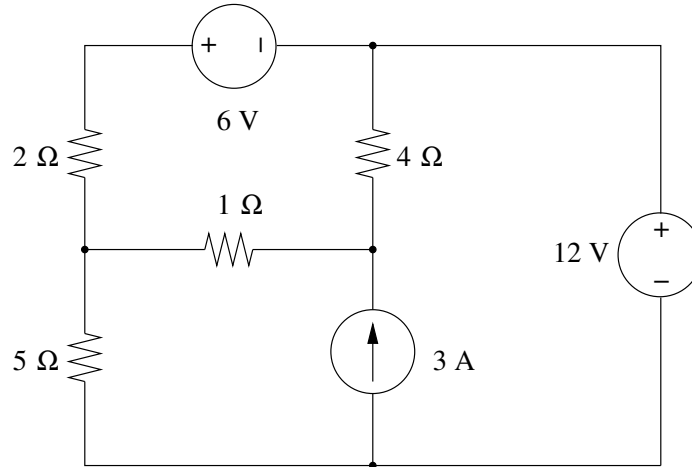


Fig. Q1. Find  $i$  by superposition

*(Question 1, additional workspace ...)*

2. For the circuit shown in Fig. Q2, use the method of your choosing to determine the power in the 12-volt source, and whether it is absorbing or delivering power.

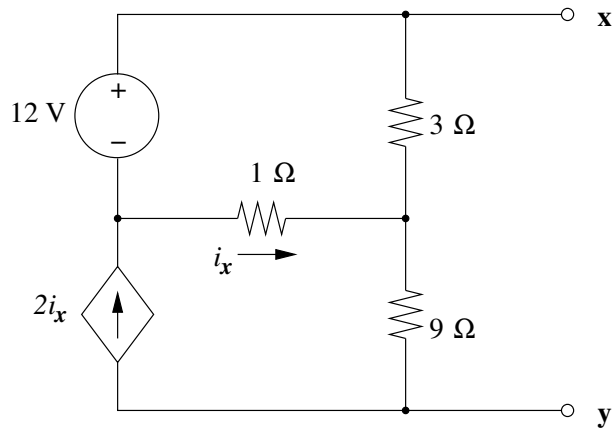
**[25 marks.]**



*Fig. Q2. Find the power in the 12-volt source*

3. Consider the circuit in Fig. Q3.

- (a) Determine the Thévenin equivalent circuit at the terminals **x** and **y**. [25 marks.]
- (b) For your answer to part (a), give the Norton equivalent circuit. [5 marks.]



*Fig. Q3. Determine the Thévenin and Norton equivalent circuits*

*(Question 3, addition workspace ...)*

4. For the circuit given in Fig. Q4:

- (a) Determine the phasor currents  $\mathbf{I}_C$  and  $\mathbf{I}_L$ , through the capacitor and the inductor, respectively. **[15 marks.]**
- (b) Using these values, determine the total current  $i(t)$  expressed in the time domain. **[10 marks.]**

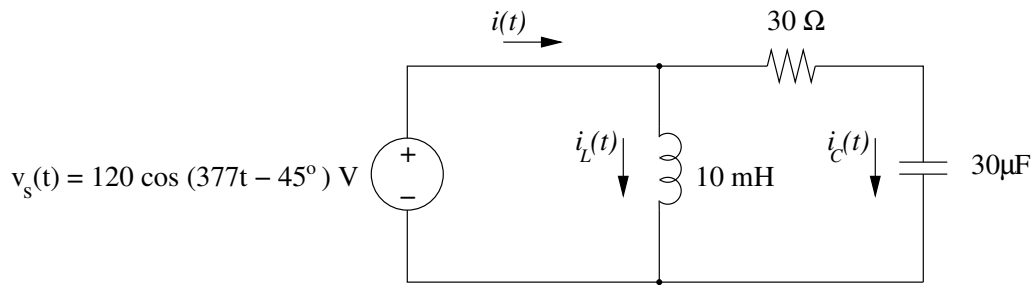


Fig. Q4. Determine  $\mathbf{I}_L$ ,  $\mathbf{I}_C$ , and  $i(t)$