King Fahd University **of Petroleum & Minerals**

Electrical Engineering Department
EE 204 Fundamentals of Electric Circuits
Second Semester (102)

Exam I
Wednesday, 16 March 2011
6:30 pm – 8:00 pm

Name: _____

ID: _____

Section: _____

Instructors	Sections
Dr. Ahmad Yamani	1, 4, 6
Dr. Qureshi	2
Dr. Hammi	3
Dr. Adel Balghonaim	5
Mr. Noman Tasaduq	7
Dr. Wajih Abul Al-Saud	8, 10
Dr. Abdulmalik Zidouri	9, 11

Problem	Score	Out of
1		40
2		30
3		30
Total		100

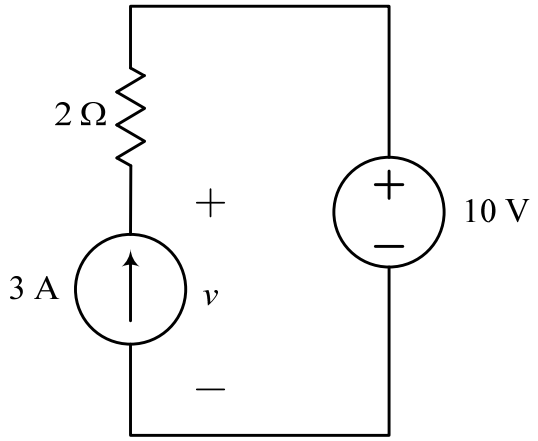
Good Luck

Problem 1

a) In the following circuit, find

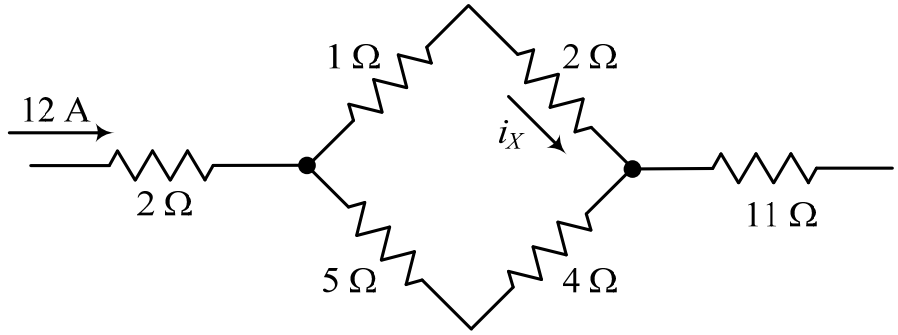
(i) the voltage v .

(ii) the power associated with the 3A current source P_{3A}.



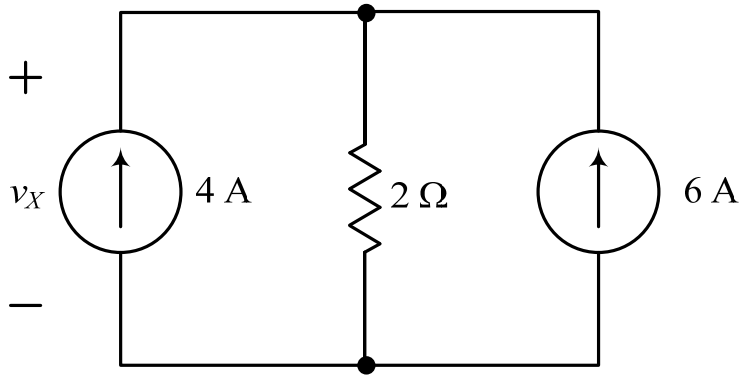
v	V
P_{3A}	W

b) Use current division to find the current i_X.



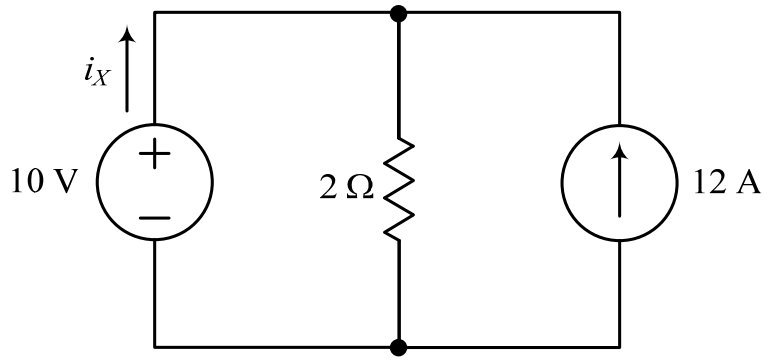
i_X	A

c) Find the voltage v_X in the following circuit.



v_X	V

d) **Find the current i_X in the following circuit.**

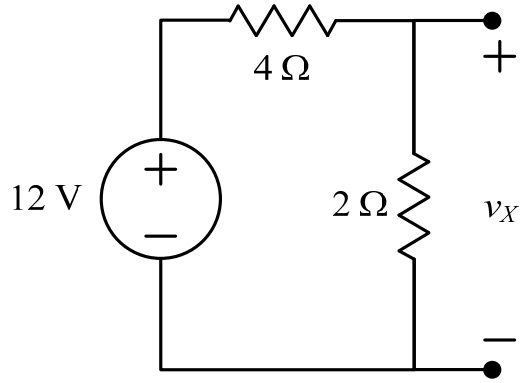


i_X	A

e) **In the following circuit, find**

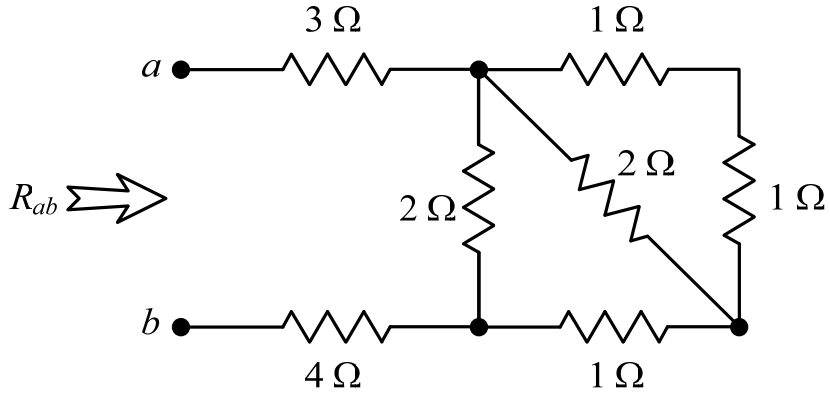
(i) **the voltage v_X .**

(ii) **the power associated with the 12V voltage source P_{12V}.**



v_X	V
P_{12V}	W

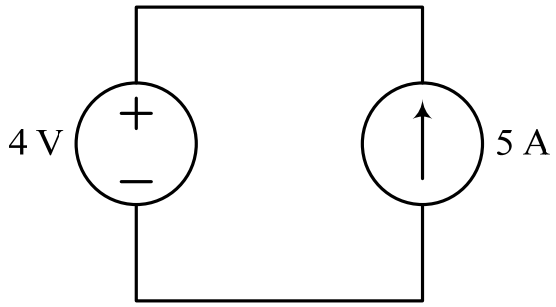
f) **Find the equivalent resistance R_{ab} in the following.**



R_{ab}	Ω

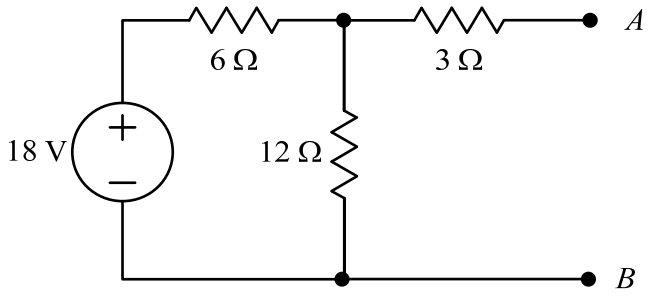
g) **In the following circuit, which of these statements is true**

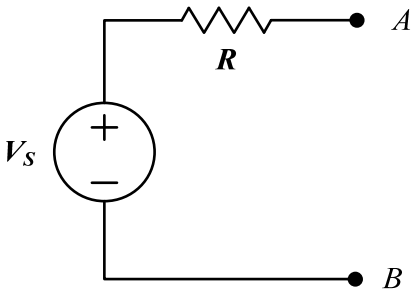
1) **Both sources are supplying 20 W of Power.**
2) **Both sources are absorbing 20 W of power.**
3) **The power in both sources is zero because no resistors exist to absorb the power.**
4) **The voltage source is supplying 20 W and the current source is absorbing 20 W.**
5) **The voltage source is absorbing 20 W and the current source is supplying 20 W.**
6) **It is not possible to determine the power supplied or absorbed by the two sources because no resistors exist in the circuit.**
7) **This circuit is invalid and the two sources should not be connected in this form.**



Correct Statement	

h) **Use source transformation to find the values of resistor R and voltage of the source V_S that make the two circuits seen between points A and B equivalent to each other.**



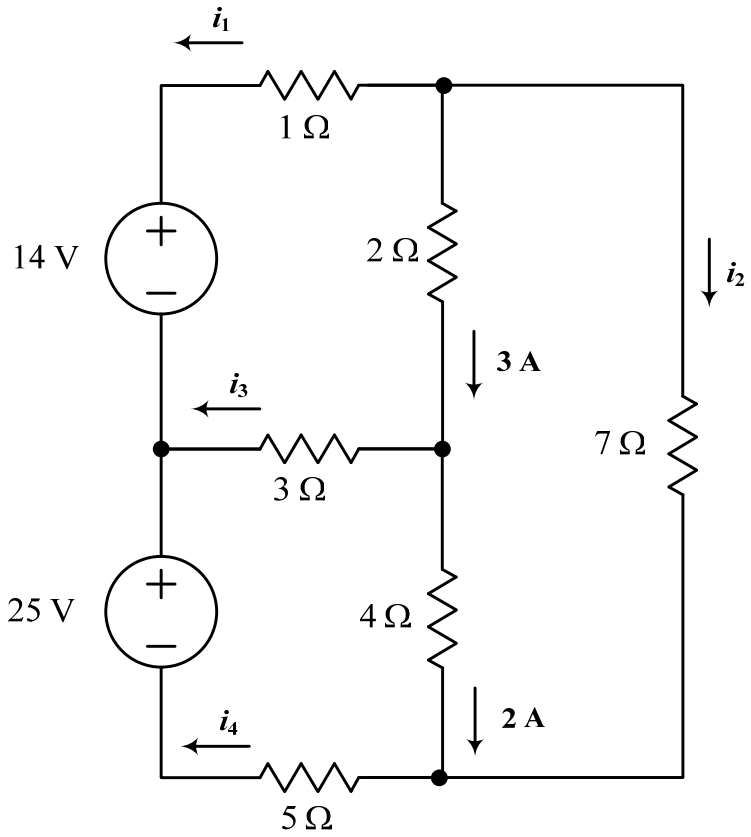


V_S	V
R	Ω

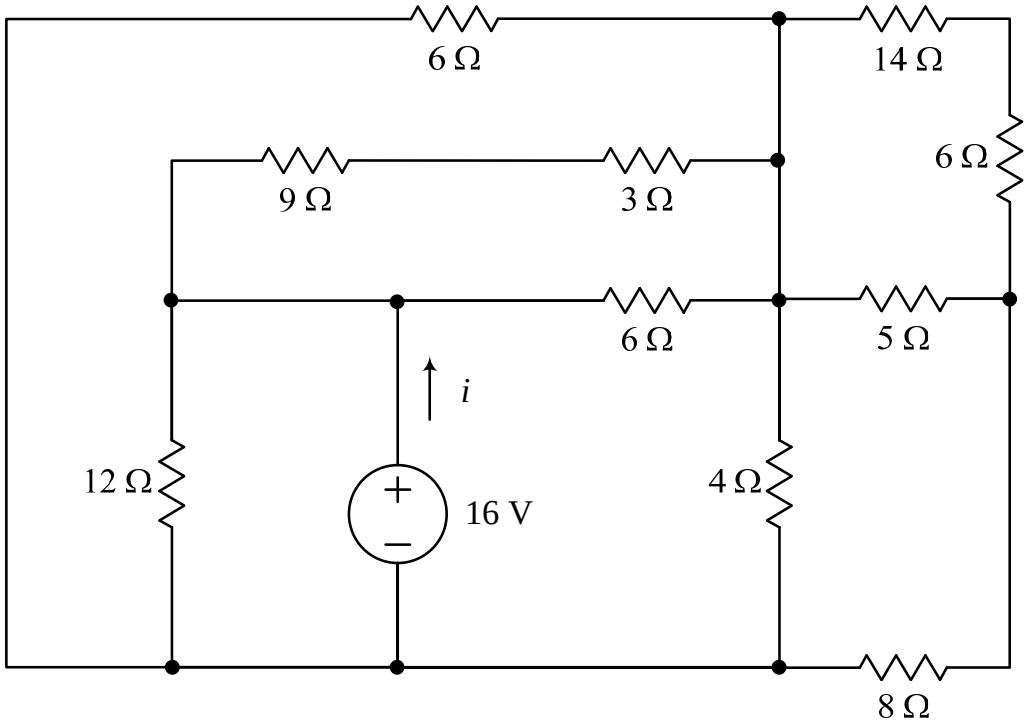
Problem 2

In the following circuit,

a) **Find the currents i_1, i_2, i_3, and i_4.**
b) **Find the powers associated with the two voltage sources (P_{14V} and P_{25V}).**
c) **Find the powers in all resistors and determine if the law of conservation of power is satisfied or not (show your work).**



i_1	A
i_2	A
i_3	A
i_4	A
P_{14V}	W
P_{25V}	W
Conservation of Power Satisfied?	

Problem 3

Using circuit reduction methods (series and parallel combination of resistors), find the value of the current *i* in the following circuit.