Current, Voltage, Power

This set of problems explore the same concepts as the list I emailed you earlier this morning, but allows Wiley Plus the automatic grading, and different set of values for each student. It is a simpler and faster assignment, but efficient nonetheless. I encourage you to work separately also on the original list and talk to me about your progress on those. Note 1: In Wiley Plus, they always refer to power "absorbed" by the element, so, if your result is a delivered power, enter it as a negative value. Note 2: Tellegen's Theorem can be stated as "in a circuit, the sum of all the absorbed power equals the sum of all the delivered power". In short, a circuit is a closed system. Good luck with this your first numerical assignment.

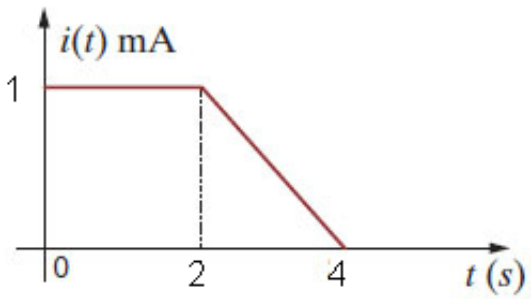
Start Date: 12 Sep 2012 at 06:00 PM
Due Date: 17 Sep 2012 at 12:00 PM

Student Access after Due Date: Yes. Attempts after Due Date will be Marked Late

Graded: Yes

Chapter 1, Problem 1.09

The current that enters an element is shown in the Figure. Find the charge that enters the element in the time interval $0 < t < 4$ s.



[ ] *1 C

Significant digits are disabled; the tolerance is +/-2%

Chapter 1, Problem 1.12

The voltage across an element is $v(t) = 10e^{-7t}$ V. The current entering the positive terminal of the element is $i(t) = 8e^{-9t}$ A. Find the energy absorbed by the element in 0.031 s starting from $t = 0$.

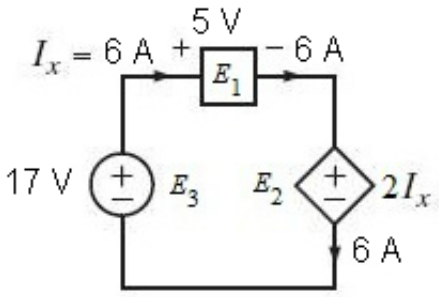
Total energy absorbed = [ ] *1 J

Significant digits are disabled; the tolerance is +/-2%

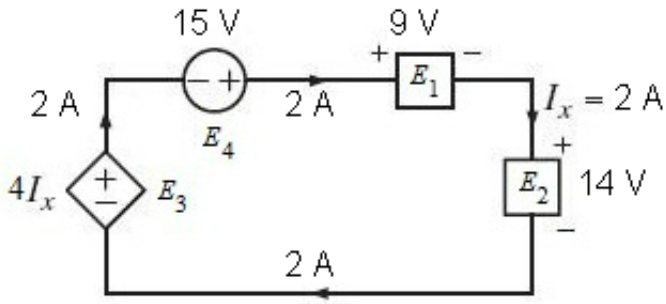
Chapter 1, Problem 1.32

Determine the power that is supplied by the circuit elements in the Figure.

(a) Power of element E_1 in Figure (a).
(b) Power of element E_2 in Figure (a).
(c) Power of element E_3 in Figure (a).
(d) Power of element E_1 in Figure (b).
(e) Power of element E_2 in Figure (b).
(f) Power of element E_3 in Figure (b).
(g) Power of element E_4 in Figure (b).



(a)

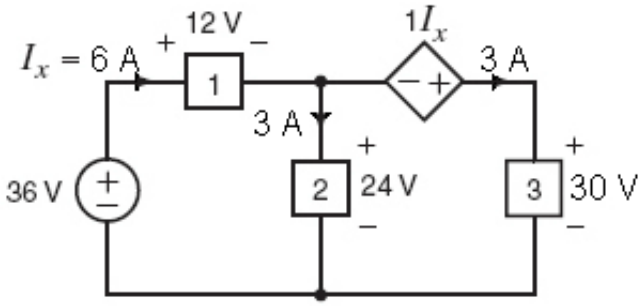


(b)

(a) [ ] *1 W
(b) [ ] *2 W
(c) [ ] *3 W
(d) [ ] *4 W
(e) [ ] *5 W
(f) [ ] *6 W
(g) [ ] *7 W

Chapter 1, Problem 1.33 (Circuit Solution)

Compute the power that is supplied by the elements in the network in the Figure.
(a) Power of element 1.
(b) Power of element 2.
(c) Power of element 3.
(d) $P_{36\ \mathrm{V}}$
(e) $P_{\text{dependent source}}$



(a) [ ] *1 W

(b) [ ] *2 W

(c) [ ] *3 W

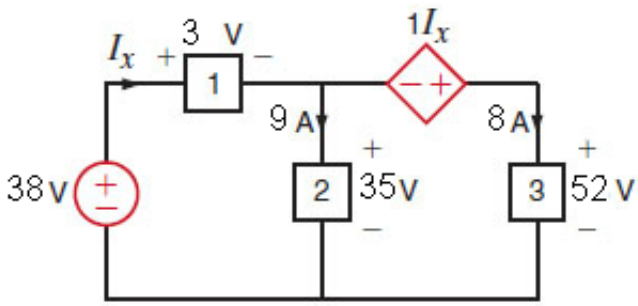
(d) [ ] *4 W

(e) [ ] *5 W

Chapter 1, Problem 1.35 (GO Multipart)

Chapter 1, Problem 1.35 GO Part 1

Find I_x in the network in the Figure using Tellegen's theorem.



Let's calculate the power absorbed by elements where we know both voltage and current.

What is the power absorbed by element 2?

$P_{abs\,2}$ = [ ] *1 W

Significant digits not applicable; exact number, no tolerance

Chapter 1, Problem 1.35 GO Part 2

What is the power absorbed by element 3?

$P_{abs\,3}$ = [ ] *1 W

Significant digits not applicable; exact number, no tolerance

Chapter 1, Problem 1.35 GO Part 3

What is the power absorbed by element 1, in terms of the unknown I_x?

$P_{abs\,3}$ = [ ] *1 × I_x W

Significant digits not applicable; exact number, no tolerance

Chapter 1, Problem 1.35 GO Part 4

What is the power absorbed by the independent voltage source, in terms of the unknown current I_x?

$P_{abs,\,indep}$ = [ ] *1 × I_x W

Significant digits not applicable; exact number, no tolerance

Chapter 1, Problem 1.35 GO Part 5

What is the power absorbed by the dependent voltage source, in terms of the unknown current I_x?

$P_{abs,dependent}$ = [ ] *1 × I_x W

Significant digits not applicable; exact number, no tolerance

Chapter 1, Problem 1.35 GO Part 6

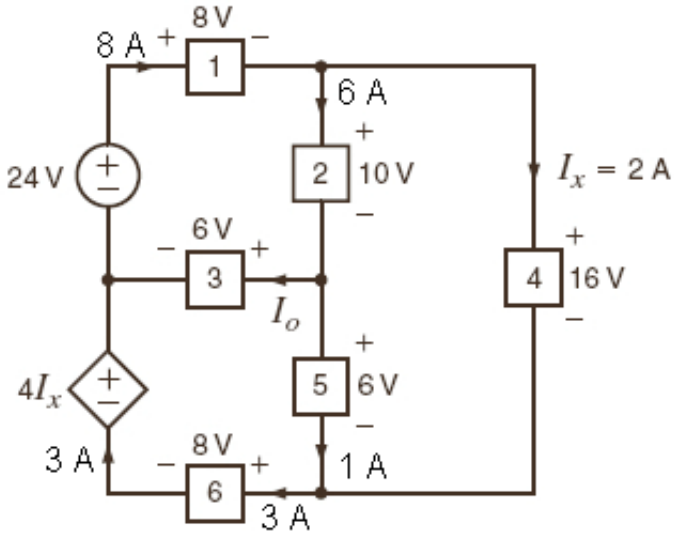
What is the unknown current I_x?

I_x = [ ] *1 A

Significant digits are disabled; the tolerance is +/-2%

Chapter 1, Problem 1.43 (Circuit Solution)

Find I_o in the network in the Figure using Tellegen's theorem.



*1 A

Significant digits not applicable; exact number, no tolerance