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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Basic Electrical Circuits (course)

Announcements (announcements) About the Course (preview) Ask a Question (forum) Progress (student/home) Mentor (student/mentor)

Unit 5 - Week 3: Power and energy in electrical elements; Circuit analysis methods

Course outline

How does an NPTEL online course work?

Week 0

Week 1: Preliminaries; Current and voltage; Electrical elements and circuits; Kirchoff's laws; Basic elements; Linearity

Week 2: Elements in series and parallel; Controlled sources

Week 3: Power and energy in electrical elements; Circuit analysis methods

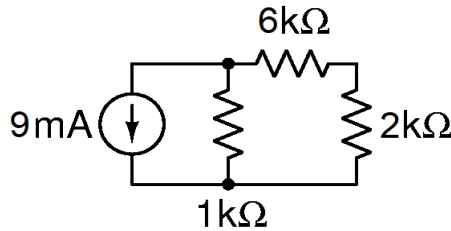
- Power and energy absorbed by electrical elements (unit? unit=25&lesson=55)
- Power and energy in a resistor (unit? unit=25&lesson=56)
- Power and energy in a capacitor (unit? unit=25&lesson=57)
- Power and energy in an inductor (unit? unit=25&lesson=58)
- Power and energy in a voltage source (unit? unit=25&lesson=59)
- Power and energy in a current source (unit? unit=25&lesson=60)
- Goals of circuit analysis (unit?unit=25&lesson=61)
- Number of independent KCL equations (unit? unit=25&lesson=62)
- Number of independent KVL equations and branch relationships (unit? unit=25&lesson=63)
- Analysis of circuits with a single independent source (unit?unit=25&lesson=64)
- Analysis of circuits with multiple independent sources using superposition (unit? unit=25&lesson=65)
- Superposition: Example (unit?unit=25&lesson=66)

Assignment 3

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-10-07, 23:59 IST.

1) Determine the power *delivered* by the current source in the figure below.

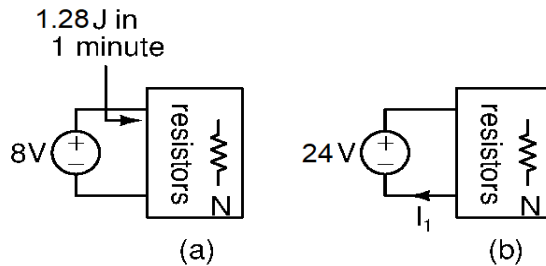


(The answer must be in **milliwatts (mW)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 71,73

1 point

2) In the figure below, in the circuit on the left, the network N which consists only of resistors draws an energy of 1.28J over a period of 1 minute. The same circuit is driven by a 24V source in (b). Determine the current I_1 .



(The answer must be in **milliamperes (mA)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 7.9,8.1

1 point

- Week 3 Lecture Material (unit?unit=25&lesson=184)
- Basic Electrical Circuits : Week 3 Feedback Form (unit?unit=25&lesson=196)
- Quiz : Assignment 3 (assessment?name=209)
- Assignment 3 solutions (unit?unit=25&lesson=214)

Week 4: Nodal analysis

Week 5 : Mesh analysis; Circuit theorems

Week 6: More circuit theorems; Two port parameters

Week 7: Two port parameters continued; Reciprocity in resistive networks

Week 8: Opamp and negative feedback; Example circuits and additional topics

Week 9 :First Order Circuits

Week 10 : First order circuits with time-varying inputs

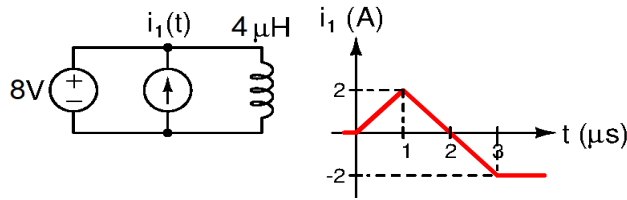
Week 11: Second order system response

Week 12: Direct calculation of steady state response from equivalent components

Text Transcripts

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3) Determine the energy *delivered* by the voltage source from $t = 0$ to $t = 3 \mu\text{s}$ in the figure below. The inductor current is zero at $t = 0$.

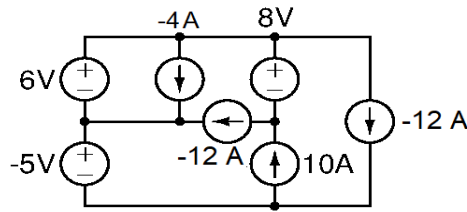


(The answer must be in **microjoules** (μJ). Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 63.65

1 point

4) Determine the power *delivered* by the 6 V voltage source in the figure below.

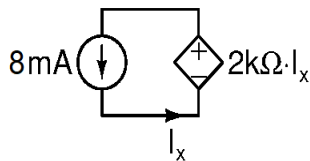


(The answer must be in **Watts** (W). Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) -228

1 point

5) In the figure below, determine the power *delivered* by the 8mA current source.

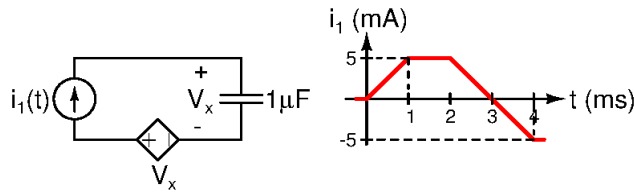


(The answer must be in **milliwatts** (mW). Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) -128

1 point

6) In the figure below, determine the energy *delivered* by the current source from $t = 0$ to $t = 4$ ms.

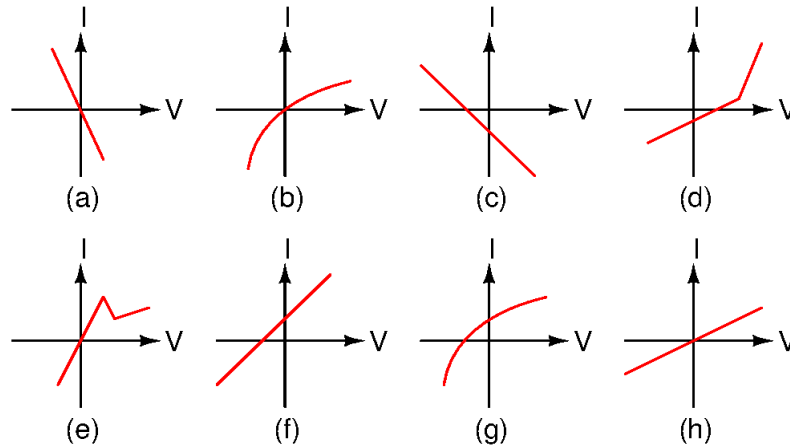


(The answer must be in **microjoules** (μJ). Round off fractional answers to one decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 0

1 point
1 point

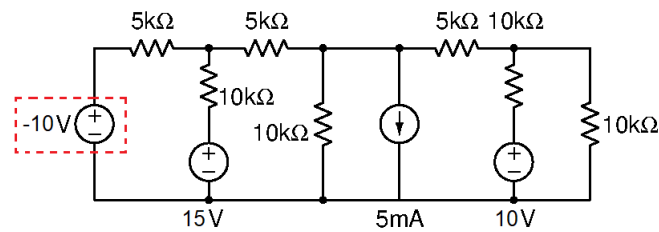
7) In the figure below, identify the elements that are passive. There may be more than one.



- a
- b
- c
- d
- e
- f
- g
- h

No, the answer is incorrect.
Score: 0
Accepted Answers:
b
e
h

8) Determine the power *delivered* by the **-10V** source in the figure below.

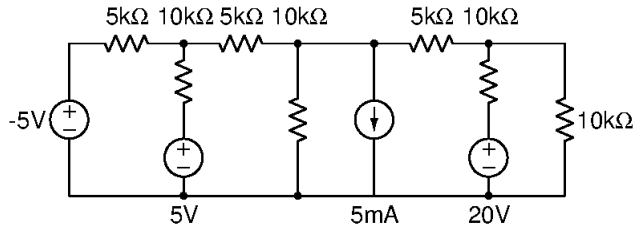


(The answer must be in **milliwatts** (**mW**). Round off fractional answers to one decimal place.)

No, the answer is incorrect.
 Score: 0
 Accepted Answers:
 (Type: Range) 5.75,6.75

1 point

9) Determine the number of independent KCL equations that can be written for the circuit below (treat each two-terminal element as a branch).

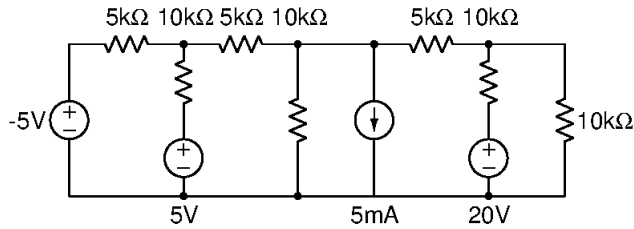


Your answer must be the number of equations.

No, the answer is incorrect.
 Score: 0
 Accepted Answers:
 (Type: Numeric) 6

1 point

10) Determine the number of independent KVL equations that can be written for the circuit below (treat each two-terminal element as a branch).



Your answer must be the number of equations.

No, the answer is incorrect.
 Score: 0
 Accepted Answers:
 (Type: Numeric) 5

1 point