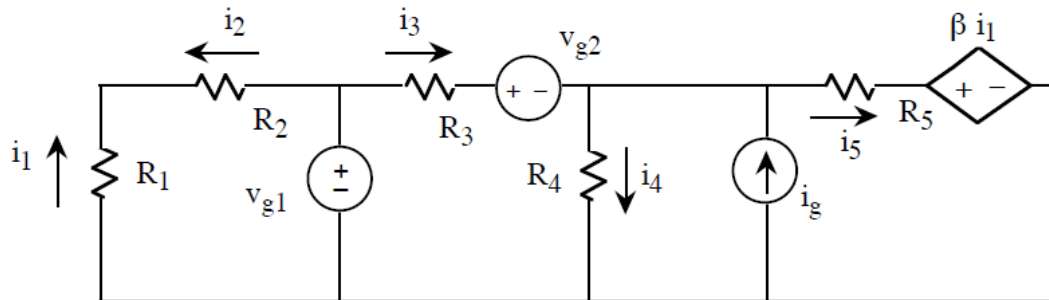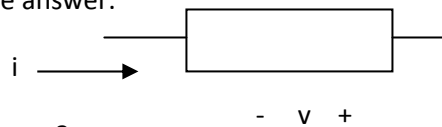Problem 1

In the circuit below, the currents in each element are labeled as shown. Using
the passive sign convention, label the potential difference across each element
and show its polarity.

Problem 2

Use the circuit diagram shown below to answer the following questions. Some of the
questions have multiple answers. Circle the answer.

a)   Is the circuit element producing power?

YES   NO   CAN'T TELL

b)   If v=5V and i=-2 mA, is the passive sign convention satisfied?

TES   NO   CAN'T TEL

c)   If v=-5V and i=-2 mA, is the passive sign convention satisfied?

TES   NO   CAN'T TEL

d)   If v=-2V and i=5 mA, then the circuit element is

Current Source   Voltage Source   Resistor

e)   If v=3V and i=7 mA, then the circuit element is

Current Source   Voltage Source   Resistor

f)   If v= 0 V and i=-7 mA, then the circuit element is

Current Source   Voltage Source   Resistor

g)   If v= -12 V and i=0 mA, then the circuit element is

Current Source   Voltage Source   Resistor

h)   Which of the following circuit elements can either absorb or dissipate power?

Current Source   Voltage Source   Resistor

i) Which of the following circuit element s can be safely connected in series with another circuit element of the same type?

Current Source   Voltage Source   Resistor

j) Which of the following circuit element s can be safely connected in parallel with another circuit element of the same type?
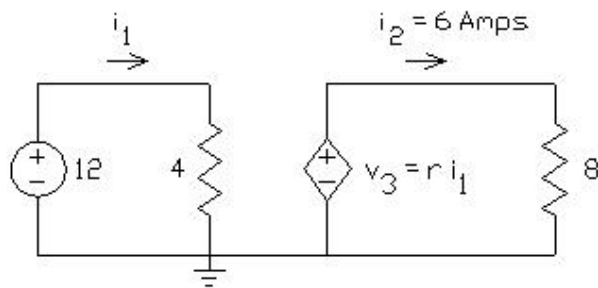
Current Source   Voltage Source   Resistor

Problem 3

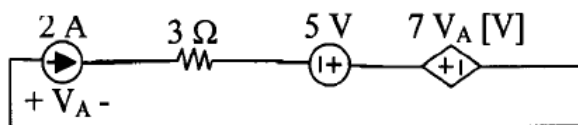The value of the gain of the dependent source is

$r = $ _____ Volts / Amp.

a. 8   b. 10

c. 12   d. 16
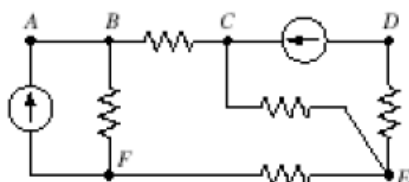
e. 20   f. 24

g. None of the above

Problem 4

Find the power associated with the dependent voltage source (P_{DEP}).
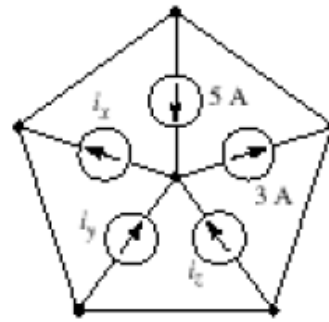

$P_{DEP} = $ _____ [W]

Problem 5

(a) How many nodes are there?
(b) How many branches are there?
(c) If we move from B to F to E to C, have we formed a path? A loop?

Problem 6

(a) Find i_x if $i_y = 2$ A and $i_z = 0$ A.

(b) Find i_y if $i_x = 2$ A and $i_z = 2 \, i_y$.

(c) Find i_z if $i_x = i_y = i_z$.

Problem 7

Find the power absorbed by each of the six circuit elements