

Midterm 1
EE40
Fall 2011

NAME: _____

Instructions

Read all of the instructions and all of the questions before beginning the exam.

There are 4 problems in this exam. The total score is 100 points. Points are given next to each problem to help you allocate time. Do not spend all your time on one problem.

Unless otherwise noted on a particular problem, you must show your work in the space provided, on the back of the exam pages or in the extra pages provided at the back of the exam.

Draw a BOX or a CIRCLE around your answers to each problem.

Be sure to provide units where necessary.

GOOD LUCK!

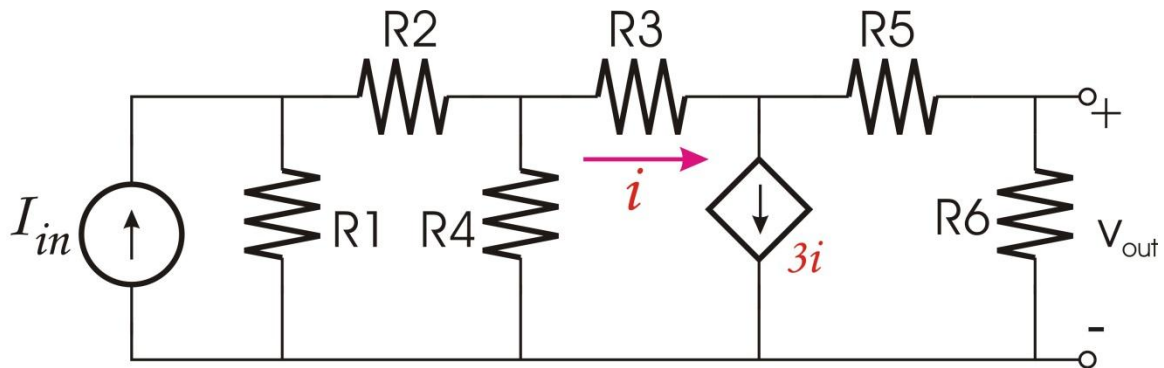
| PROBLEM | POINTS | MAX |
|----------------|---------------|------------|
| 1 | | 20 |
| 2 | | 25 |
| 3 | | 25 |
| 4 | | 30 |

O-Ren Ishii: You didn't think it was gonna be that easy, did you?
The Bride: You know, for a second there, yeah, I kinda did.
O-Ren Ishii: Silly rabbit.
The Bride: Trix are for...
O-Ren Ishii: ...kids.

-Kill Bill, Vol. 1

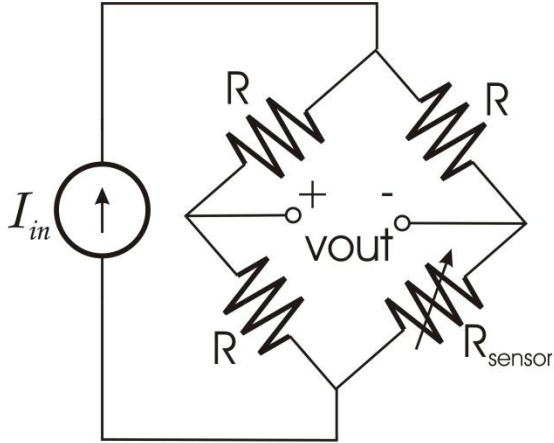
Problem 1 Warm-up

a) (8 points) Solve for v_{out} .

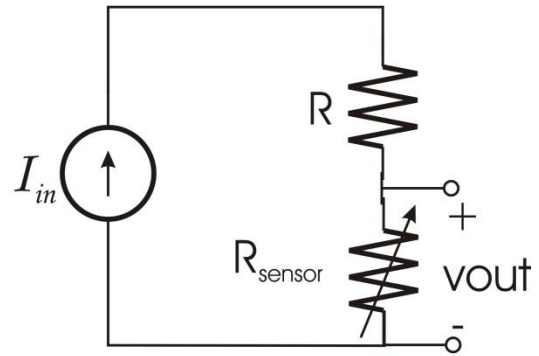


Solution:

b) (12 points) Solve for v_{out} for both circuits.



A



B

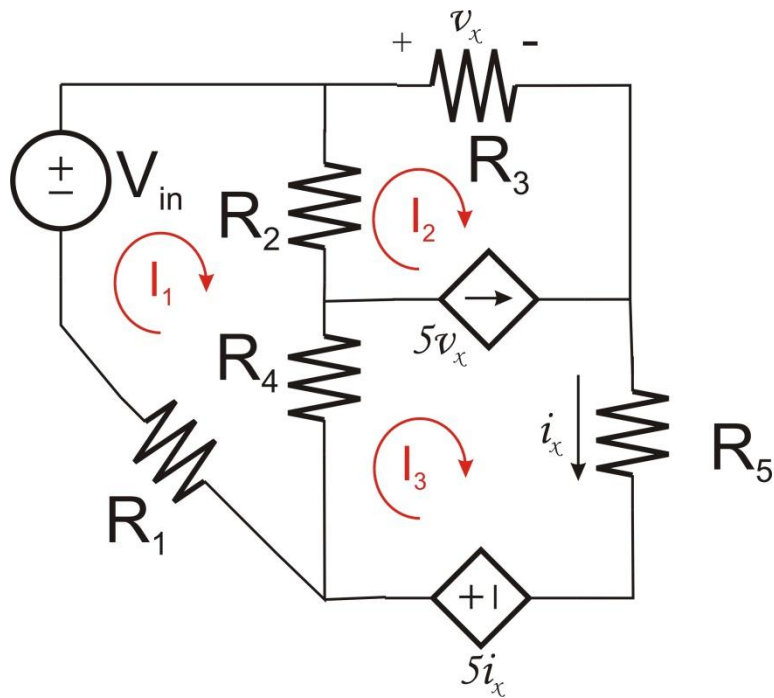
Solution A

Solution B

"R2 says the chances of survival are 775 to one." -C3PO
 "Never tell me the odds." -Han Solo

Problem 2 Mesh (25 points)

Provide a solution to the circuit below USING MESH analysis. Use the mesh variables and directions provided below in red.



In the box below, provide your answer in this form or lose points (if there are extra equations, just write them in as well):

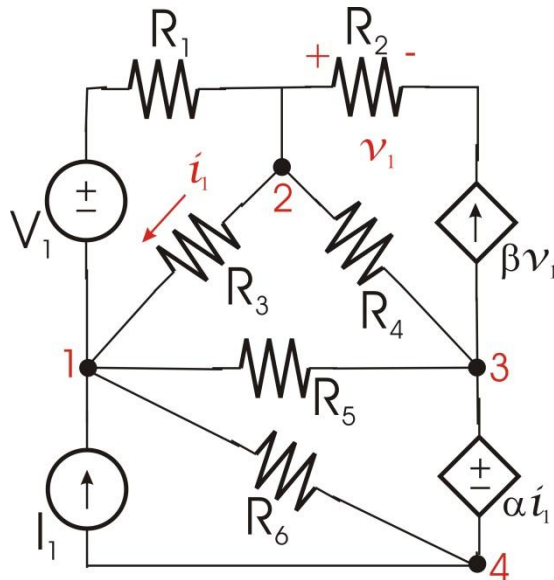
$$\begin{array}{r} \underline{\quad} i1 \\ \underline{\quad} i1 \\ \underline{\quad} i1 \end{array} + \begin{array}{r} \underline{\quad} i2 \\ \underline{\quad} i2 \\ \underline{\quad} i2 \end{array} + \begin{array}{r} \underline{\quad} i3 \\ \underline{\quad} i3 \\ \underline{\quad} i3 \end{array} = \underline{\quad} = \underline{\quad} = \underline{\quad}$$

Solution:

“Paranoia is just life on a finer scale.”
-*Strange Days*

Problem 3 Nodal (25 points)

Provide a solution to the circuit below USING NODAL analysis. Use the node numbers and directions provided below in red.



In the box below, provide your answer in this form or lose points (if there are extra equations, just write them in as well):

$$\underline{\quad} v1 + \underline{\quad} v2 + \underline{\quad} v3 + \underline{\quad} v4 = \underline{\quad}$$

$$\underline{\quad} v1 + \underline{\quad} v2 + \underline{\quad} v3 + \underline{\quad} v4 = \underline{\quad}$$

$$\underline{\quad} v1 + \underline{\quad} v2 + \underline{\quad} v3 + \underline{\quad} v4 = \underline{\quad}$$

$$\underline{\quad} v1 + \underline{\quad} v2 + \underline{\quad} v3 + \underline{\quad} v4 = \underline{\quad}$$

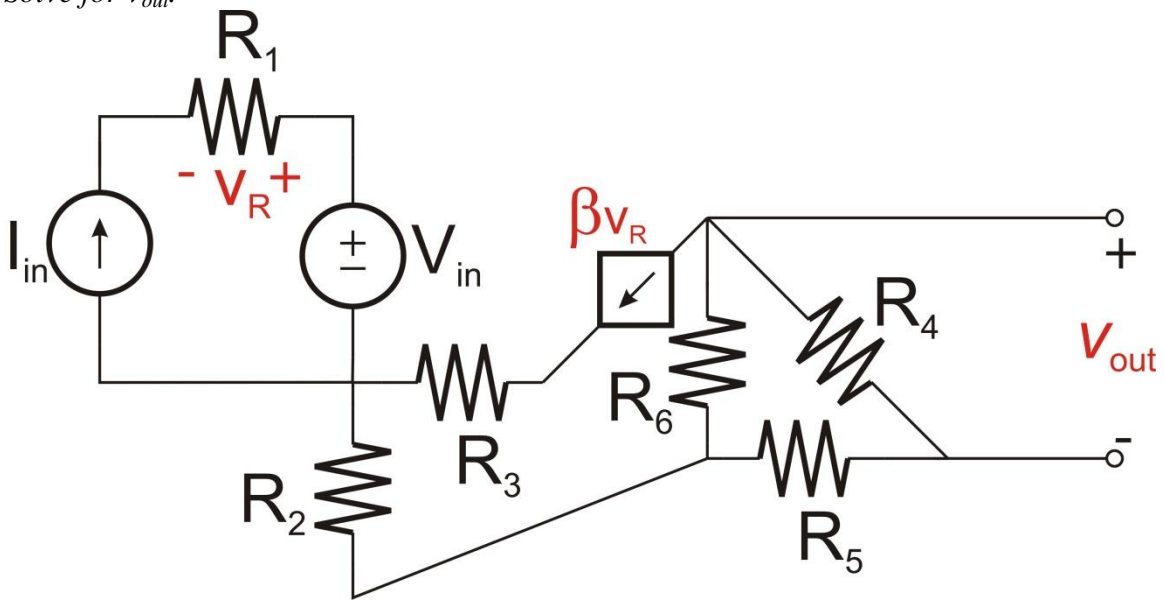
Solution:

"I went on what the movies called a roaring rampage...I roared and I rampaged and I got bloody satisfaction. I've killed a hell of alot of people to get to this point. And I have only one left. The last one."

-Kill Bill, vol. 2

Problem 4 Wacky (30 points)

Solve for v_{out}



Solution:

Blank area for the solution.