

Write your name at the top right corner of every page (including this cover page and any extra pages).

Copy everything you want counted towards your grade onto the pages that I provided. Use the extra pages I provide if necessary.

Write with a pen that cannot be erased!

No books and none of your own calculators are allowed! Use the calculators that we provide.

Write down all the steps that lead to your result. If we cannot see how you arrived at the result, no points will be awarded.

Clearly identify all variables that you may introduce in the circuit diagrams.

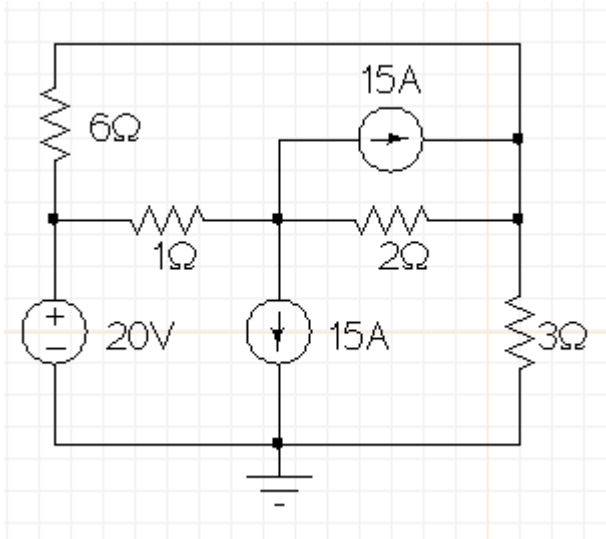
Read all the problems before you start so that you can begin with those that seem easiest to you.

The last problem is for the 6610 students only. Should students from 3610 attempt to solve the problem, points they gain may be used to proportionally replace the lowest scoring problem in their main section. In other words: Should a 3610 student get 100% on the last problem but e.g. a lowest score of only 50% on the first problem, the complete score for that student will be calculated with 100% of the points for the first problem replacing the actually achieved 50% of points on the real first problem.

Students from 3610 are not required to do the last problem!

Problem 1 (13 pts):

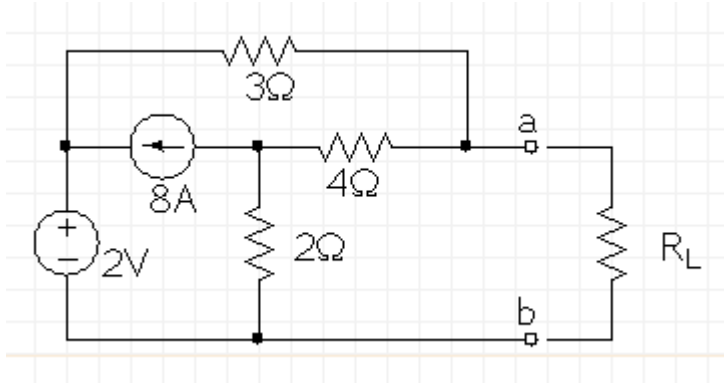
Find the node voltages for the circuit below. (As always:) Label the circuit diagram accordingly to show what your variables mean.



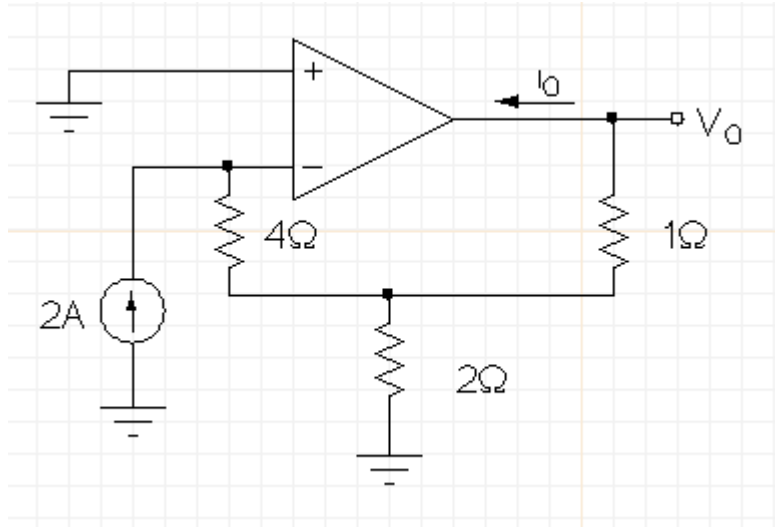
(continuation of problem 1)

Problem 2 (10 pts):

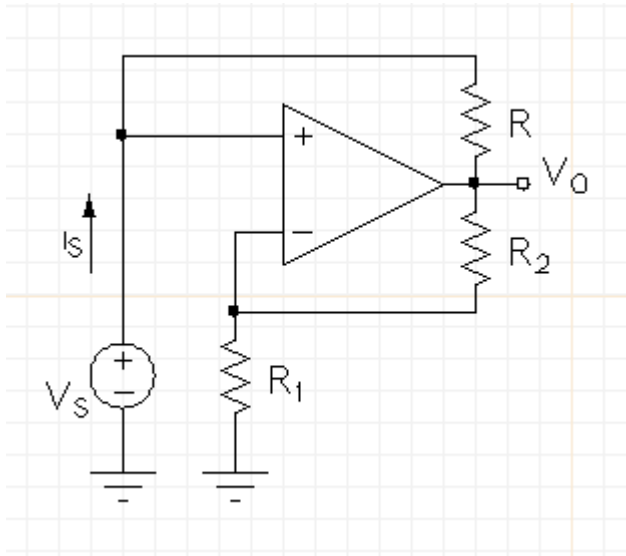
Find the Thevenin equivalent of the circuit to the left of the terminals a and b. Use the Thevenin equivalent to find the power absorbed in the load R_L if $R_L = 3\Omega$. Draw the circuit of the Thevenin equivalent with the 3Ω load.



(continuation of problem 2)

Problem 3 (6 pts):Find V_O and i_O :

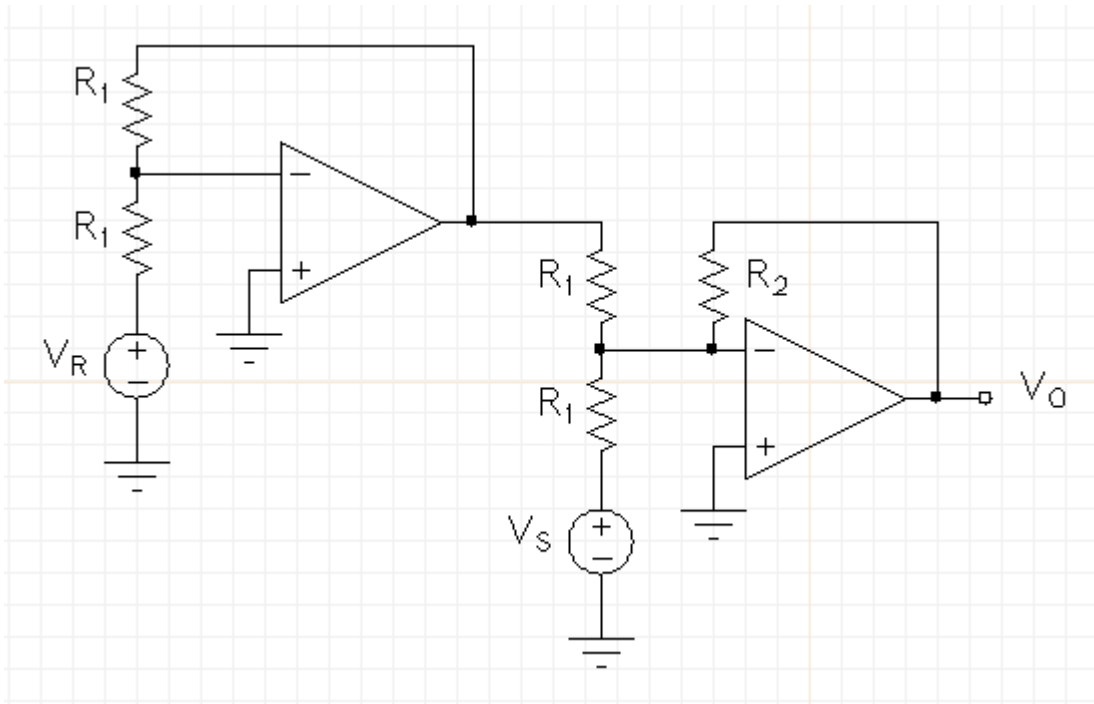
(continuation of problem 3)

Problem 4 (7 pts):Find V_O and the resistance V_S/i_S :

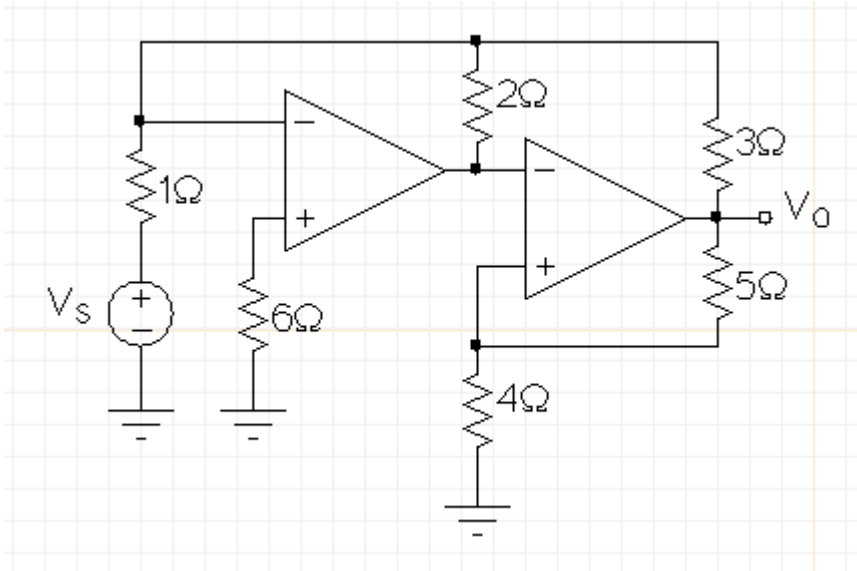
(continuation of problem 4)

Problem 5 (10 pts):

Find an expression for V_O as a function of the resistances and the two input voltages V_R and V_S :



(continuation of problem 5)

Problem 6 ONLY 6610 students (10 pts):Find the output voltage V_O :

(continuation of problem 6)