

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

Copy everything you want counted towards your grade onto the pages that I provided.

Write with a pen that cannot be erased!

No books or calculators are allowed!

Write down all the steps that lead to your result.

Identify new variables that you may introduce in the circuit diagrams that I provided.

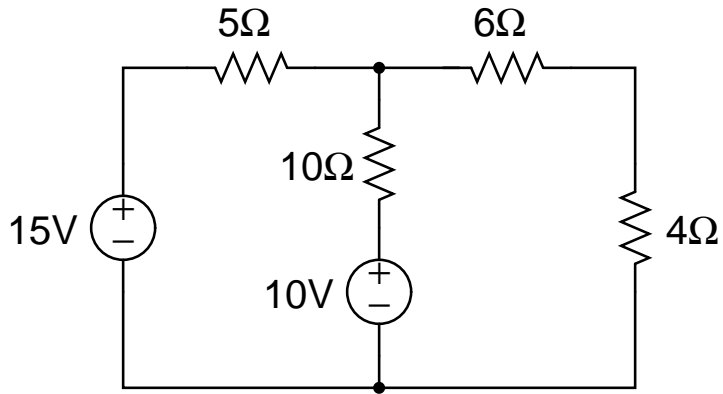
Read all the problems before you start so that you can begin with those that seem easiest to you.

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 respective first problem.

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

Problem 1 (8 pts):

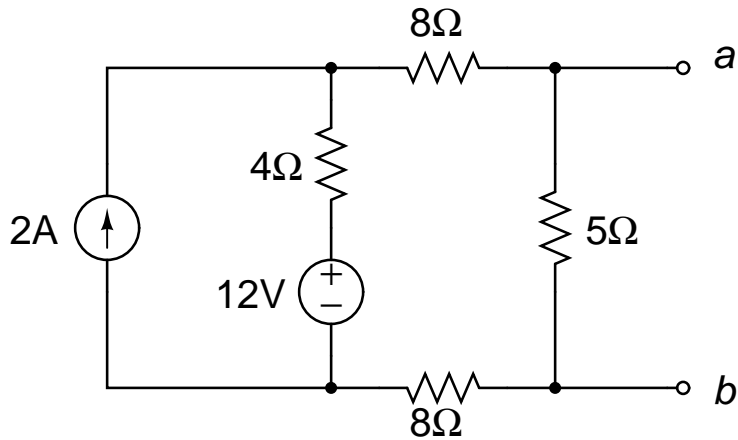
- Find: a.) the current through each individual resistor,
b.) the power dissipated in the 4Ω resistor.



(continuation of problem 1)

Problem 2 (8 pts):

Find the Norton equivalent circuit for the circuit shown below and draw it. If you connect a load resistor R_L between the terminals a and b : Calculate the power that is dissipated in R_L if $R_L = 2\Omega$.

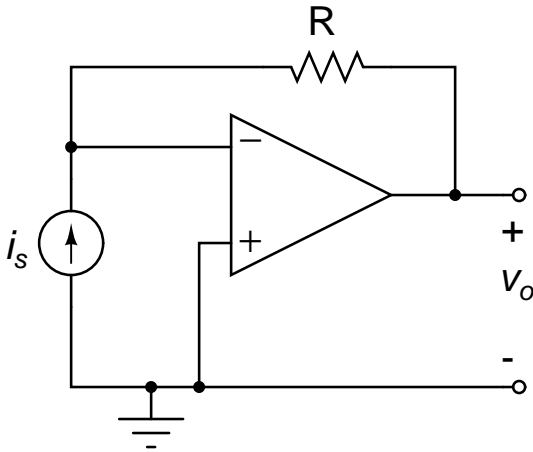


Given your Norton equivalent circuit: What is the Thevenin equivalent circuit for the problem?

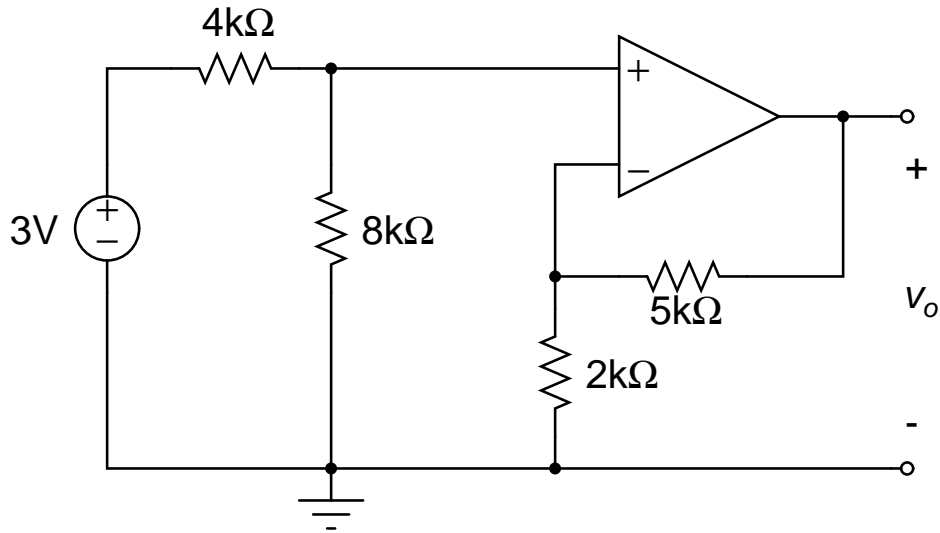
(continuation of problem 2)

Problem 3 (3 pts):

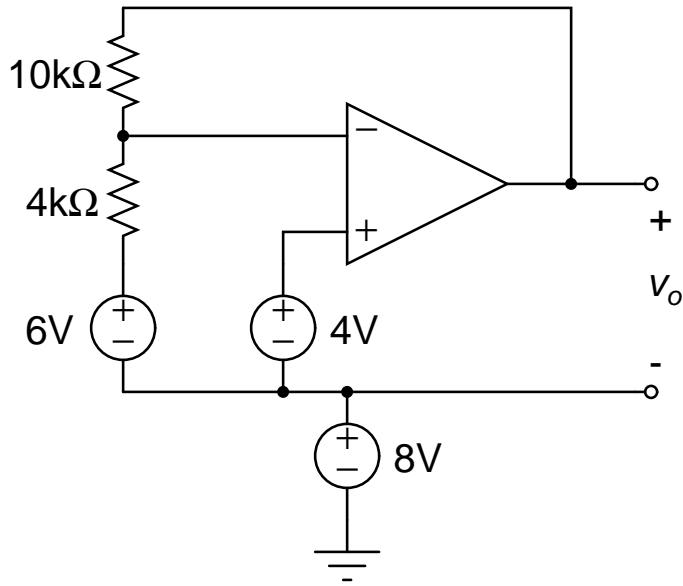
How does the output voltage v_o depend on the input current i_s in this so-called *transresistance amplifier*?



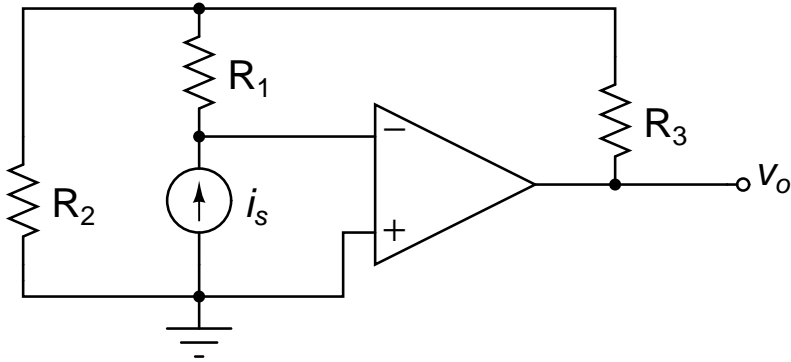
(continuation of problem 3)

Problem 4 (6 pts):Calculate v_o in the circuit below.

(continuation of problem 4)

Problem 5 (5 pts):Calculate v_o in the circuit below.

(continuation of problem 5)

Problem 6 ONLY 6610 students (7 pts):What is the ratio v_o/i_s for the circuit below?

(continuation of problem 6)