

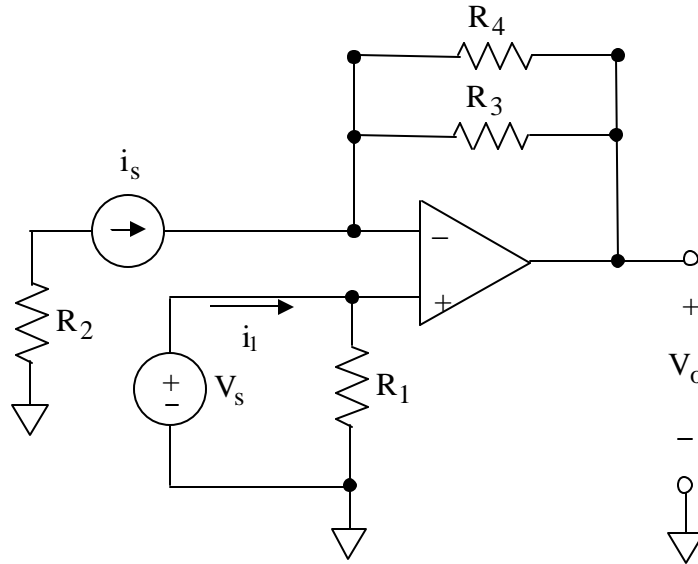
UNIVERSITY OF UTAH
ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

ECE 1270

HOMEWORK #9

Spring 2008

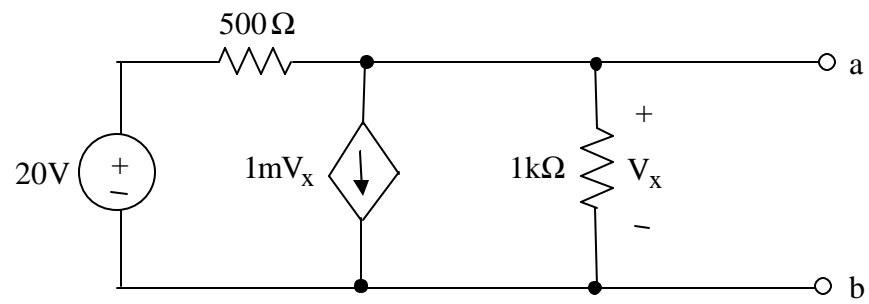
1.



The above circuit operates in linear mode. Derive a symbolic expression for v_o . The expression must contain not more than the parameters i_s , V_s , R_1 , R_2 , R_3 , and R_4 .

2. Answer the following questions from the circuit in Problem 1.
- If $i_s = 0$ A, find the value of R_1 that will yield an output voltage of $v_o = 1$ V when $V_s = 1$ V. Explain your answer.
 - Using the value of R_1 from part (a), find the value of i_s that will yield $v_o = -1$ V when $V_s = 0$ V and $R_3 = R_4 = 10\text{k}\Omega$.
 - Using the value of R_1 from part (a), calculate the input resistance, $R_{in} = V_s/i_1$, seen by the V_s source.

3.



- Find the Thevenin equivalent of the above circuit relative to terminals **a** and **b**.
- If we attach R_L to terminals **a** and **b**, find the value of R_L that will absorb maximum power.
- Calculate the value of that maximum power absorbed by R_L .