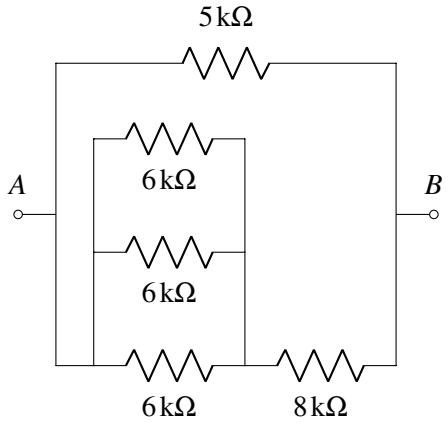
EECS 16A Designing Information Devices and Systems I
Spring 2018 Discussion 7B

1. Series and Parallel Combinations

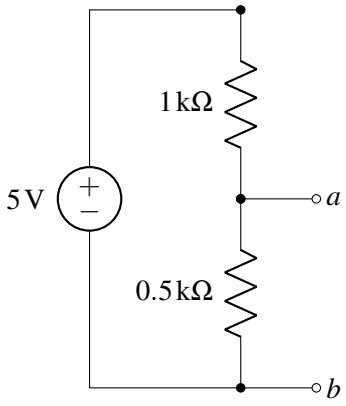
For the resistor network shown below, find an equivalent resistance between the terminals A and B using the resistor combination rules for series and parallel resistors.



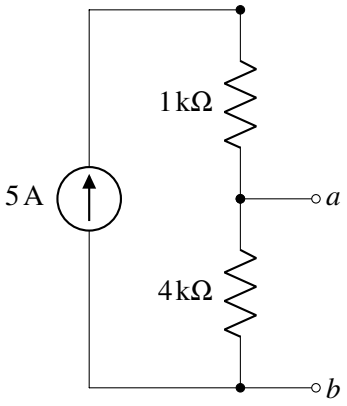
2. Equivalence

Find the Thévenin and Norton equivalents across terminals a and b for the circuits given below.

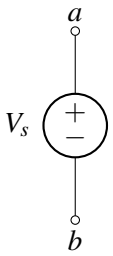
(a)



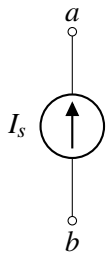
(b)



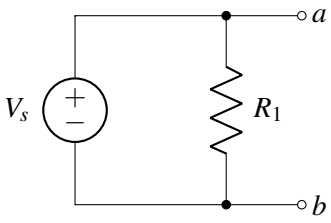
(c)



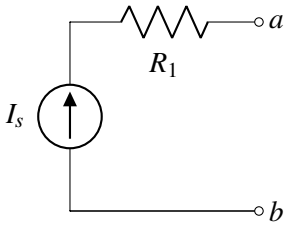
(d)



(e)

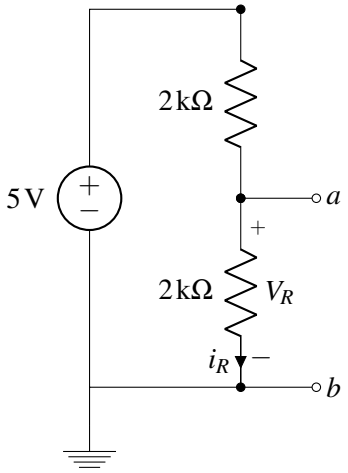


(f)

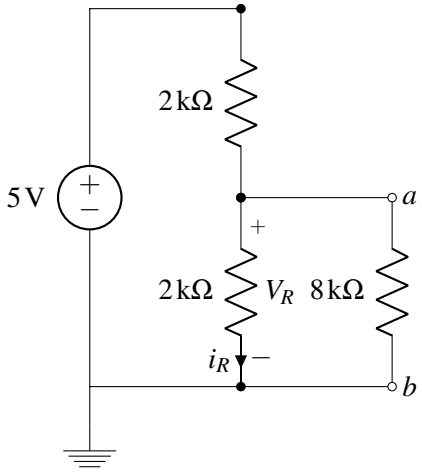


3. Why Bother With Thévenin Anyway?

(a) Find a Thévenin eqiuvalent for the circuit shown below.

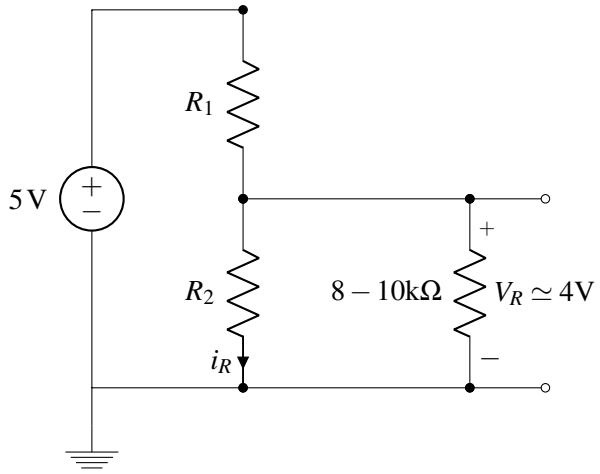


(b) What happens to the output voltage V_{ab} if we attach a load of 8 kΩ to the output as depicted in the circuit below. Use your Thévenin equivalent from part (a).



(c) What if the load is $\frac{8}{3}$kΩ? What if the load is 80 kΩ?

(d) Say that we want to support loads in the range of 8 kΩ to 10 kΩ. We would like to maintain 4 V across these loads. How can we approximately achieve this by setting R_1 and R_2 in the following circuit?



(e) For part (b), how much power does each element dissipate? Calculate the power using your Thévenin equivalent and using the original circuit. Are the values the same?