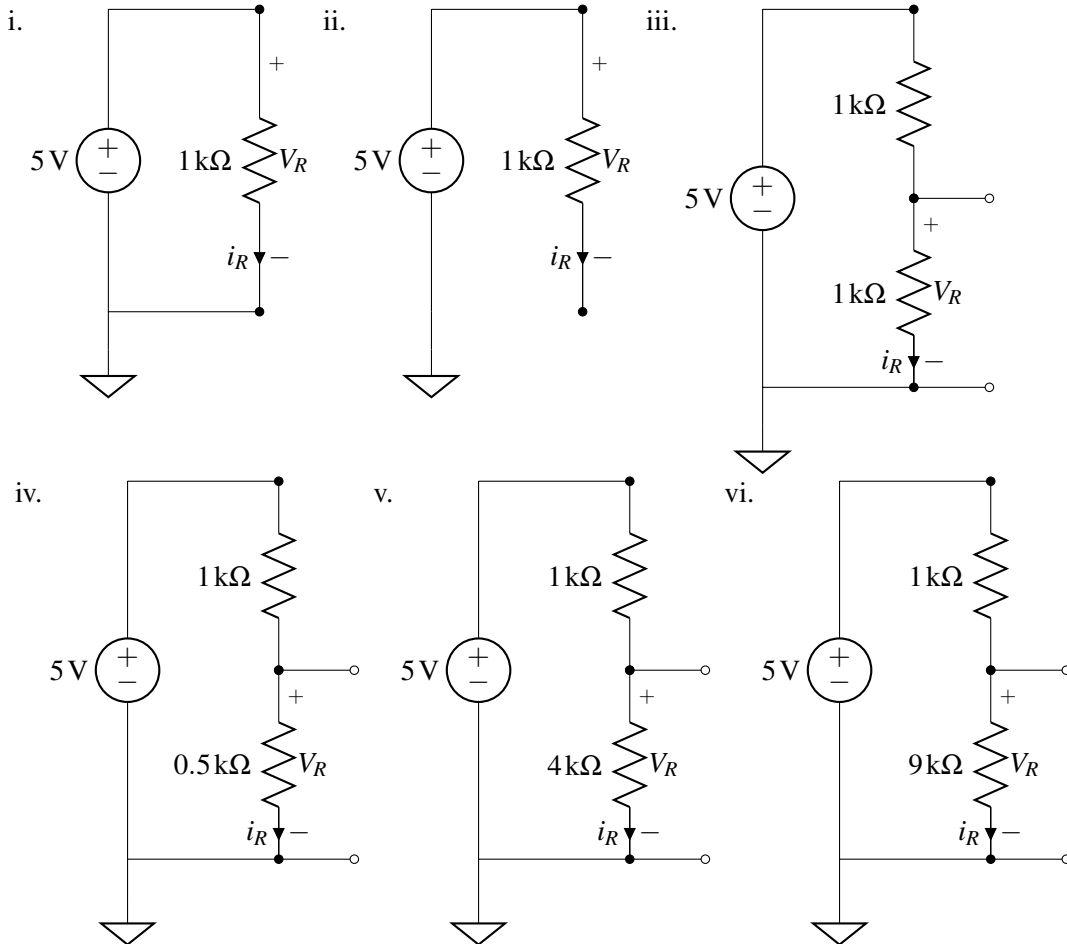
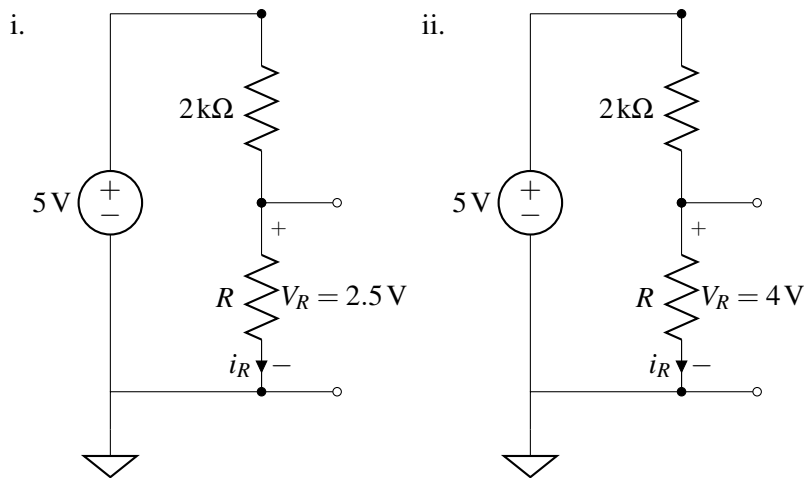


1. Voltage Divider

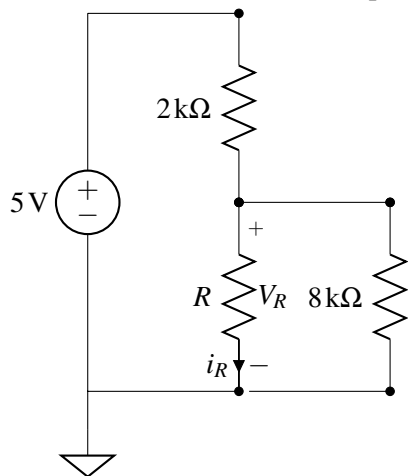
(a) Find the voltage V_R and current i_R in the following circuits. Use KCL/KVL and Ohm's law.



(b) Find the resistance R that achieves the voltage V_R . What is the current i_R ?

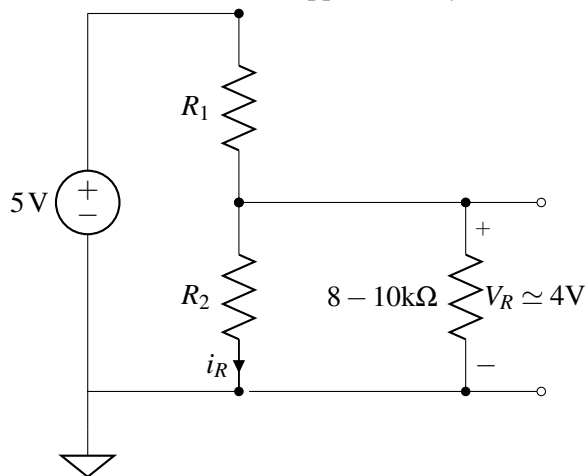


(c) Using the resistance R from part (b)ii., what happens to the output voltage V_R (and the current i_R) if we attach a load of $8\text{ k}\Omega$ to the output as depicted in the following circuit:



(d) What if the load is $\frac{8}{3}\text{ k}\Omega$? What if the load is $80\text{ k}\Omega$?

(e) Say that we want to support loads in the range of $8\text{ k}\Omega$ to $10\text{ k}\Omega$. We would like to maintain 4 V across these load. How can we approximately achieve this by setting R_1 and R_2 in the following circuit?



(f) How much power will each resistor draw in this case? Is this efficient?