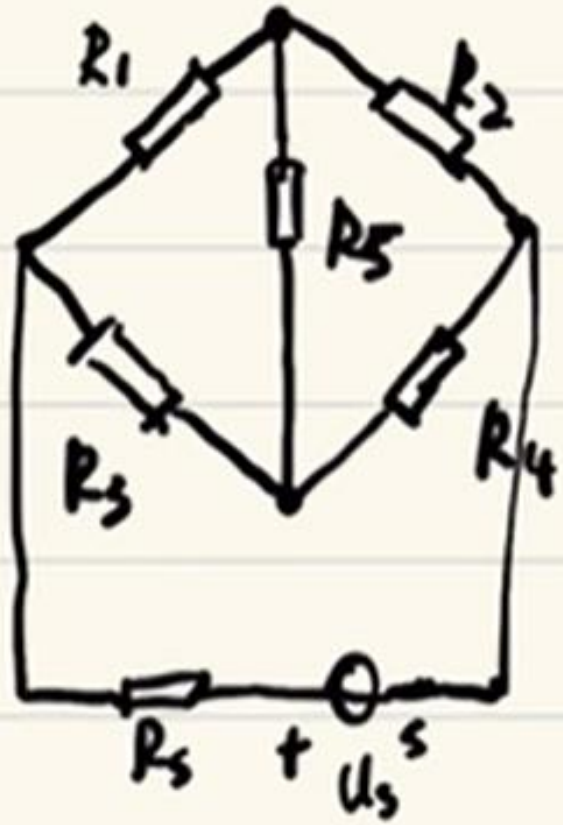


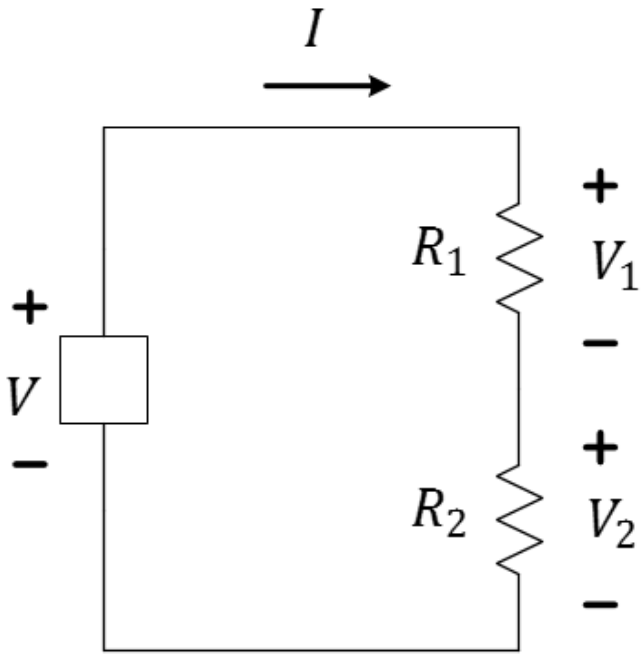
$R_1 R_4 = R_2 R_3$

R_5 可看作开路

Lecture 8: Application of Circuit Laws

- Example Problems and Practice

VDR for Two Resistances



$$V_1 = \frac{R_1}{R_1 + R_2} V$$

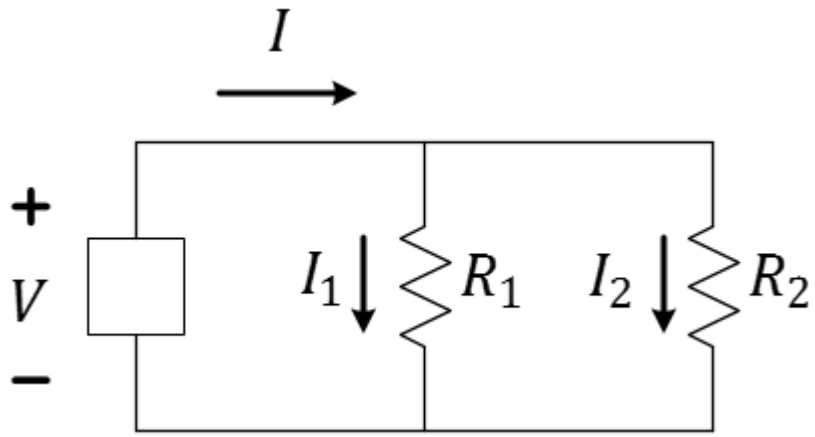
$$V_2 = \frac{R_2}{R_1 + R_2} V$$

Bad Idea: try to memorize these formulae.
Good Idea: try to note trends and understand concepts !

Example, if $R_1 = 1\ \Omega$ and $R_2 = 2\Omega$, then $V_2 : V_1$ will be in a $2:1$ ratio for the series circuit.

Why?

VDR and CDR for Two Resistances



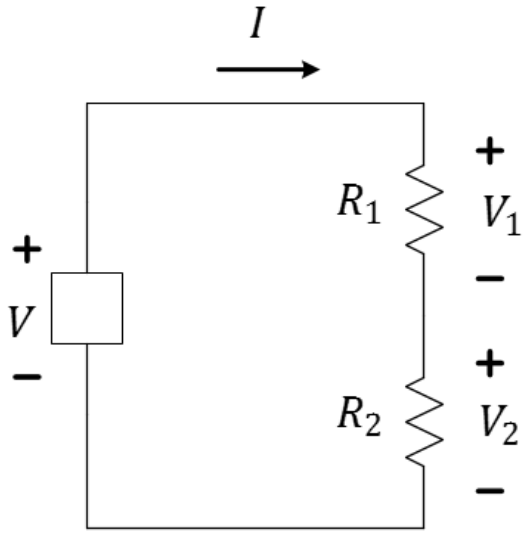
$$I_1 = \frac{R_2}{R_1 + R_2} I \qquad I_2 = \frac{R_1}{R_1 + R_2} I$$

Bad Idea: try to memorize these formulae.
Good Idea: try to note trends and understand concepts !

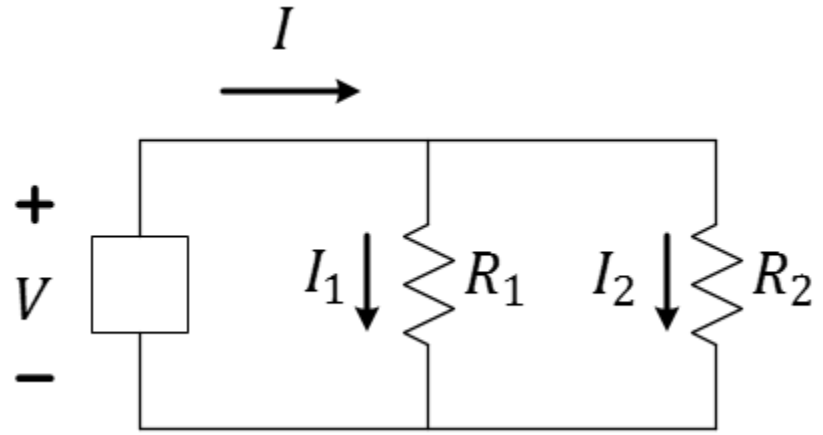
Example, If $R_1 = 1\ \Omega$ and $R_2 = 2\Omega$, then $I_2 : I_1$ will be in a $1:2$ ratio for the parallel circuit.

Why?

VDR and CDR for Two Resistances

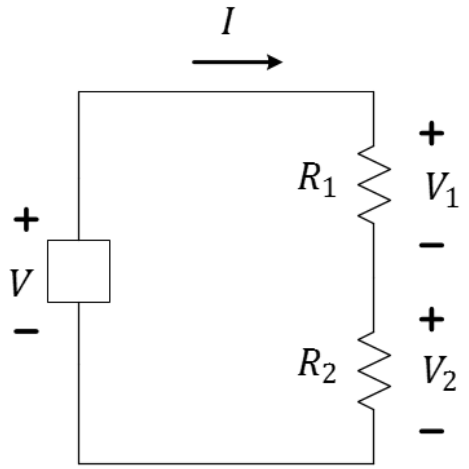


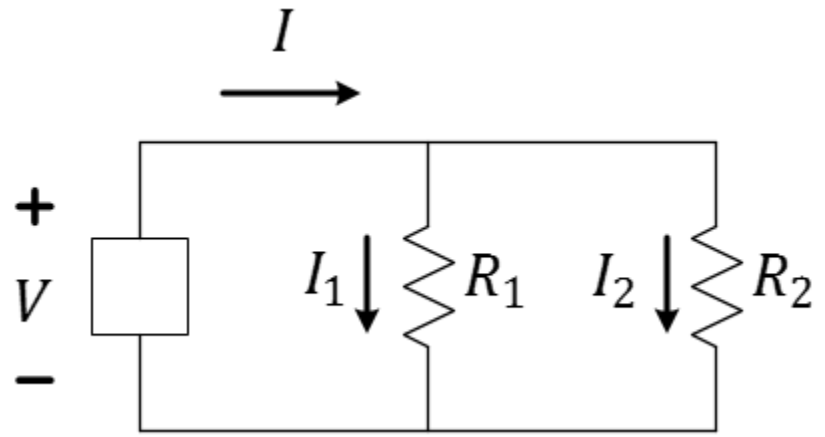
Q: If $6\ V$ falls across a series combination of $1\ k\Omega$ and $2\ k\Omega$, what is V across $2\ k\Omega$?



Q: If 0.15 A flows through a parallel combo of $1\ k\Omega$ and $2\ k\Omega$, what is I through $2\ k\Omega$?

VDR and CDR for Two Resistances

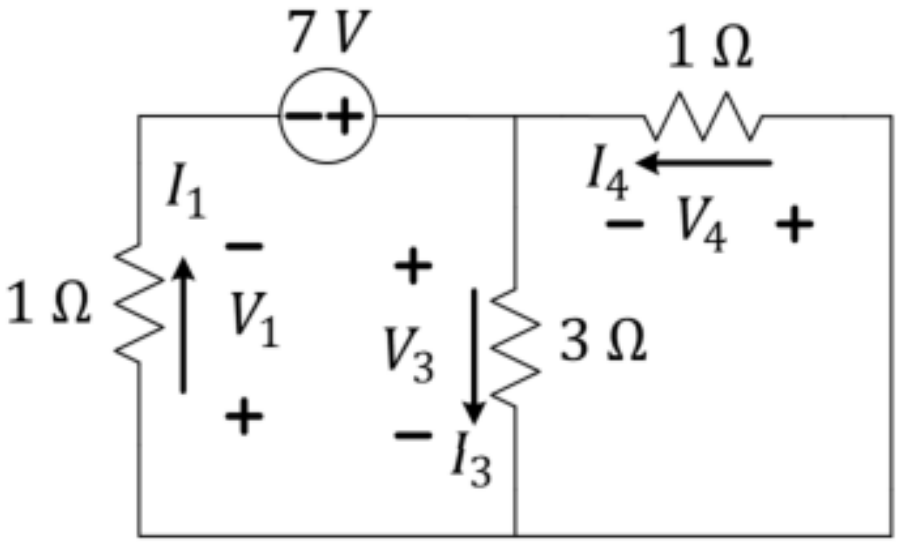




Q: If a source supplies $60\ W$ to a series combination of $10\ \Omega$ and $30\ \Omega$, what is the power absorbed by the $10\ \Omega$ resistor? What power is absorbed by the $30\ \Omega$ resistor?

Q: If a source supplies $300\ mW$ to a parallel combination of $3\ k\Omega$ and $2\ k\Omega$, what is the power absorbed by the $3\ k\Omega$ resistor? What power is absorbed by the $2\ k\Omega$ resistor?

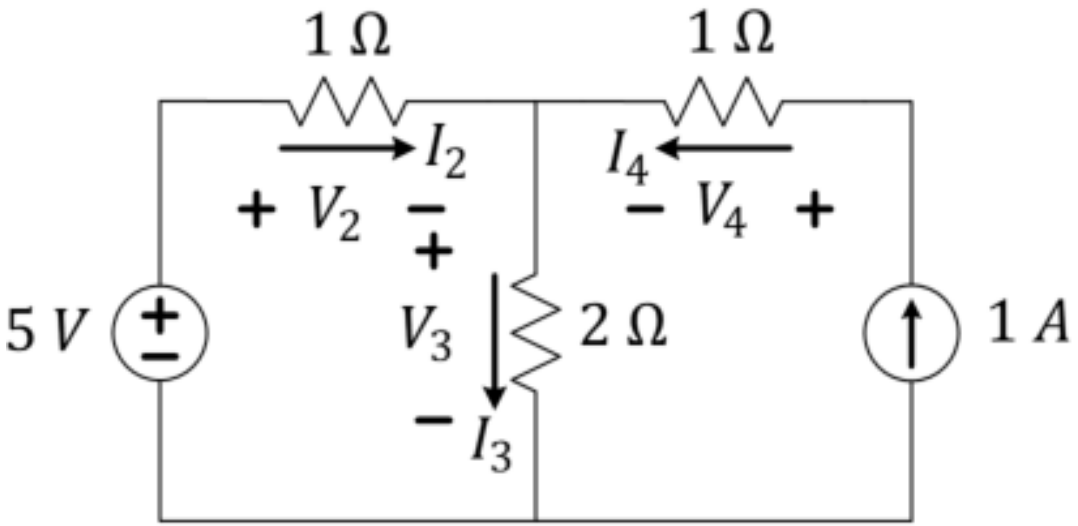
Circuits solved with Ohm's + KCL + KVL



Find the value of the current I_3.

$$I_3 = 1\ A.$$

Circuits solved with Ohm's + KCL + KVL



Find the value of the current I_3.

$$I_3 = 2\ A$$

Learning Objectives

- Use resistor ratios to find voltage, current, and power for series and parallel elements.
- More practice on Kirchhoff's Laws for circuit analysis.