Electrical Circuits

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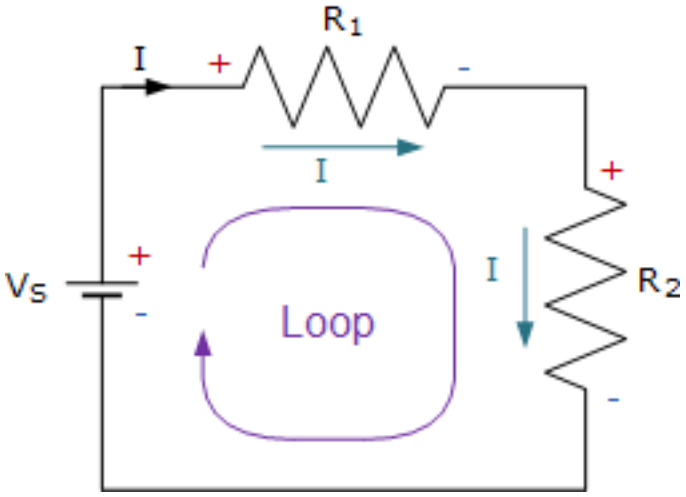
MATH 2270-2

Abstract

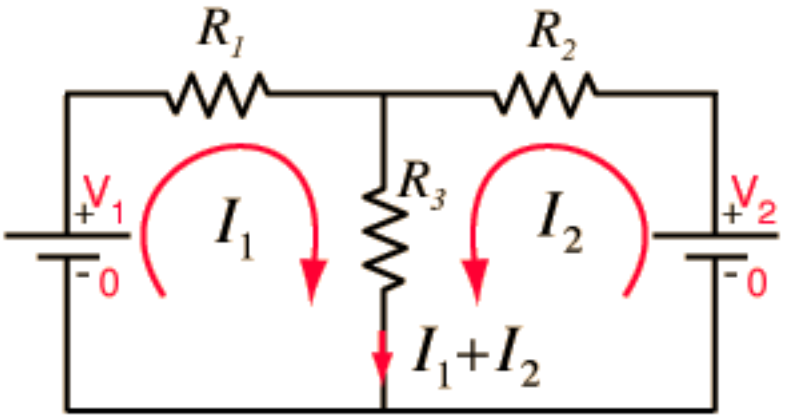
I will use the applications of linear algebra to find the current and voltage along with the relationship in complex electrical circuits. By using Ohm's law and Kirchoff's Law, a matrix can be created to find voltage and currents. Linear Algebra can be a useful tool in simplifying several Physics equations into one simple matrix, showing the input currents and final voltages.

Draft Summary

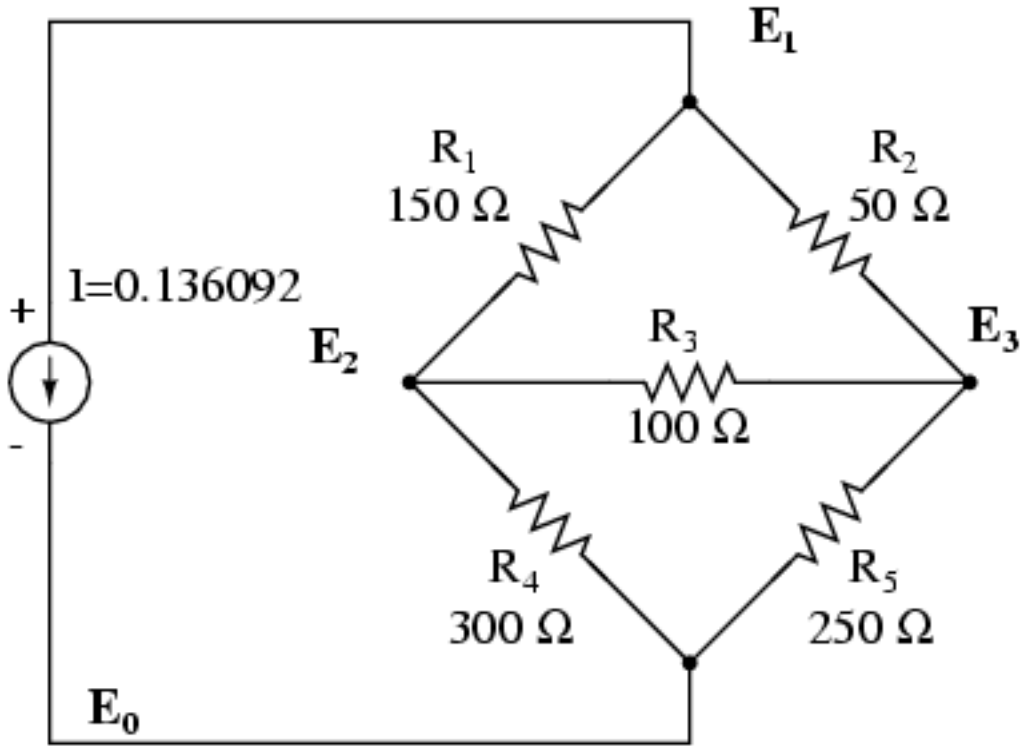
Kirchoff's Voltage Law states that for any closed loop in a circuit, the algebraic sum of all the voltages around the loop equal zero. By setting up a matrix with correlating voltges and making the last column in the matrix zero, the matrix can be manipulated to find the Circuit Current (I).



Vs=IR1+IR2
=I(R1+R2)
I=VS/(R1+R2)



The matrix can be used for 2 loops or more complicated loops similiar to the one below.



Once the matrices are set up, we'll find the Circuit current in each network using simple Row Reduction in Maple.