Problem 1.
Find the currents $i_1$ and $i_2$ for the following circuit. What is the magnitude and direction of the current flowing through the 30Ω resistor?

Problem 2.
Using nodal analysis derive and put in a matrix form the equations for the node voltages of the circuit.

Problem 3.
Using the principle of superposition, calculate the current through resistor $R_3$.

For the same circuit, calculate the Thevenin equivalent resistance seen by resistor $R_3$. Also find the Thevenin voltage and the Norton current seen by load $R_3$. 
Problem 4.
For the Wheatstone bridge circuit determine the Thevenin equivalent circuit seen by resistor $RL$. 

![Circuit Diagram](image-url)