Experiment:
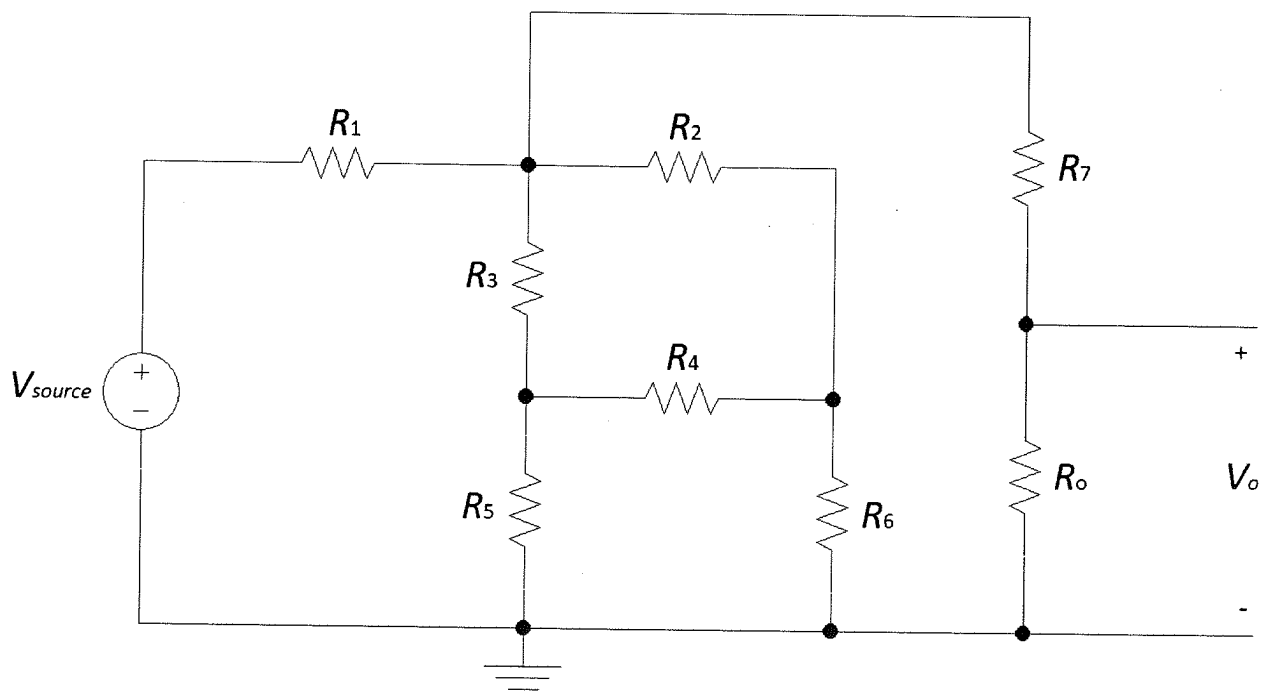
i.   Given the following circuit, use mesh analysis to generate a 4x4 matrix for the 4 current loops in the circuit. Choose the loops and their directions yourself. Include a redrawn circuit diagram in your report indicating your 4 loop currents chosen.

ii.   Given that $V_{source} = 4V$, $R_1 = 220\Omega$, $R_2 = R_3 = R_5 = 1k\Omega$, $R_4 = R_6 = R_7 = 10k\Omega$, and $R_o = 24.7k\Omega$, calculate the currents using your matrix from part i.

iii.   Build the circuit and use the voltmeter tool on the Analog Discovery 2 to check you answer from part ii by measuring the 4 currents in the circuit. Record the calculated and measured currents in the table below and include it in your report.

	$I_{calculated}$ (mA)	$I_{measured}$ (mA)
I_1		
I_2		
I_3		
I_4		

iv.   Calculate V_o, and then use the voltmeter tool in Waveforms 2015 to confirm your calculations.

v.   Calculate the power dissipated in R_o.

vi.   Change R_o to $1k\Omega$ and redo parts iv and v.

vii.   Change V_{source} to a sine wave with a frequency of 2kHz, amplitude of 3V, and zero offset. Show V_o on the oscilloscope in Waveforms 2015 and include a screenshot in your report.