

Problem 1:

A)

HW 4

① V_1 : $\frac{V_1 - V_2}{R} + \frac{V_1 - V_3}{R} + \frac{V_1 - V_4}{R} + \frac{V_1 - V_4}{R} = 0$
 $4V_1 - V_2 - V_3 - V_4 = V_4$

V_2 : $\frac{V_2 - V_1}{R} + \frac{V_2 - V_4}{R} + \frac{V_2}{R} = 0$
 $-V_1 + 3V_2 - V_4 = 0$

V_3 : $\frac{V_3 - V_1}{R} + \frac{V_3 - V_4}{R} + \frac{V_3 - V_4}{R} = 0$
 $-V_1 + 3V_3 - V_4 = V_4$

V_4 : $\frac{V_4 - V_1}{R} + \frac{V_4 - V_2}{R} + \frac{V_4 - V_3}{R} + \frac{V_4 - 0}{R} = 0$
 $-V_1 - V_2 - V_3 + 4V_4 = 0$

Above is the written solution to part A, simply solved the equations using Kirchhoff's law.

B)

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C:\Users\lab\Dropbox\Computational Physics\Computational-Physics-Python\Jinesh_H
w4>python -i Prob1.py
[3.0, 1.6666666666666665, 3.333333333333333, 2.0]
>>>
```

Above is the solution when using Gaussian elimination. The roots are 3, 1.67, 3.33, 2.0 for V_1 through V_4 respectively.