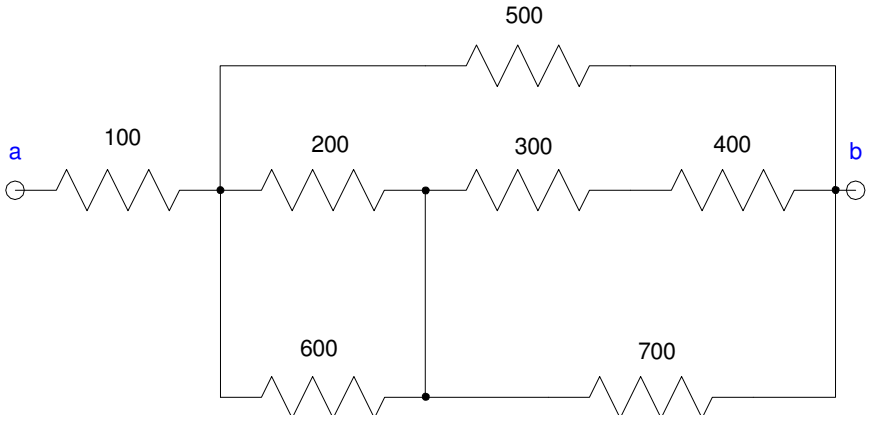
ECE 476 - Homework #1

Python Programming - Due Wednesday, September 3rd

1) Use Thonny as a calculator (similar to the Matlab command window) to determine the resistance Rab

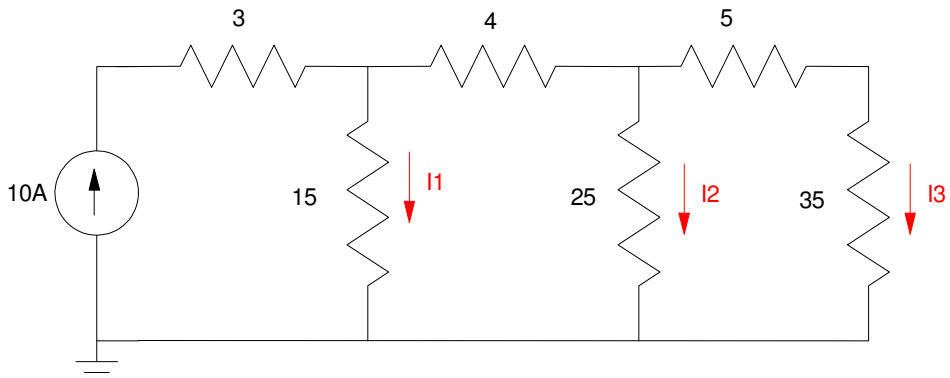


From the shell window

```
>>> R1 = 300 + 400
>>> R2 = 1 / (1/R1 + 1/700)
>>> R2
350.0

>>> R3 = 1 / (1/200 + 1/600)
>>> R3
150.0

>>> R4 = R2 + R3;
>>> R4
500.0

>>> R5 = 1 / (1/R4 + 1/500)
>>> R5
250.0

>>> Rab = 100 + R5
>>> Rab
350.0
```

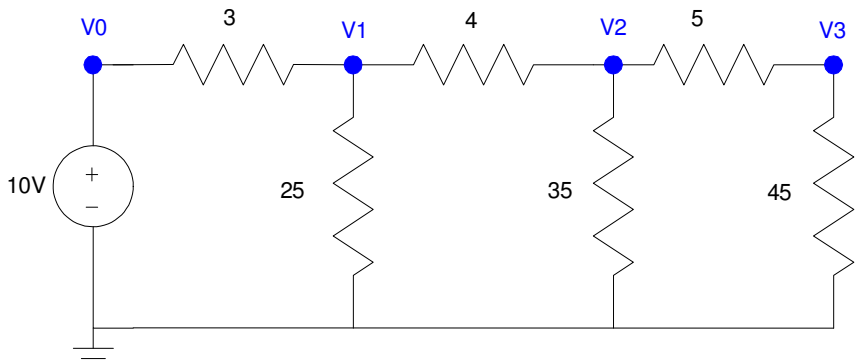
Rab = 350.0 Ohms

2) Use Thonny as a calculator to determine the currents using current division



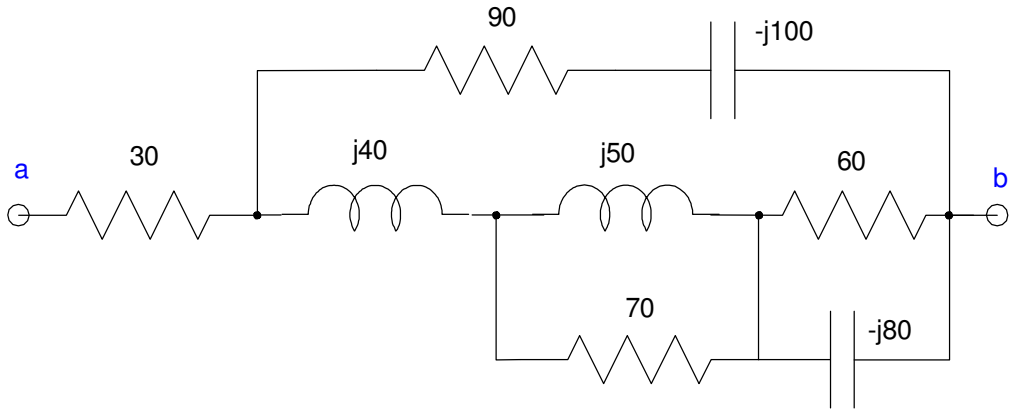

```
>>> R2 = 1 / (1/25 + 1/40)
>>> R1 = 1 / (1/15 + 1/(4 + R2))
>>> I1 = 1/15 / (1/15 + 1/(4+R2)) * 10
>>> I1
5.637584

>>> I23 = 10  - I1
>>> I23
4.362416

>>> I2 = 1/25 / (1/25 + 1/40) * I23
>>> I2
2.684564

>>> I3 = I23 - I2
>>> I3
1.677852
```

3) Use Thonny as a calculator to determine the voltages {V1, V2, V3}




```
>>> R3 = 45

>>> R2 = 1 / ( 1/35 + 1/50)
>>> R2
20.58823

>>> R1 = 1 / (1/25 + 1/(4+R2))
>>> R1
12.3962

>>> V1 = R1 / (R1 + 3) * 10
>>> V1
8.051468

>>> V2 = R2 / (R2 + 4) * V1
>>> V2
6.74166

>>> V3 = 45 / (45 + 5) * V2
>>> V3
6.067493
```

4) Use Thonny as a calculator to determine the impedance Zab




```
>>> Z1 = 1 / ( 1/60 + 1/(-80j))
>>> Z1
(38.4-28.8j)

>>> Z2 = 1 / ( 1/50j + 1/70)
>>> Z2
(23.64865+33.10811j)

>>> Z3 = Z1 + Z2 + 40j
>>> Z3
(62.04865+44.30811j)

>>> Z4 = 1 / ( 1/Z3 + 1/(90-100j) )
>>> Z4
(62.786+8.415304j)

>>> Zab = Z4 + 30
>>> Zab
(92.786+8.415304j)
```