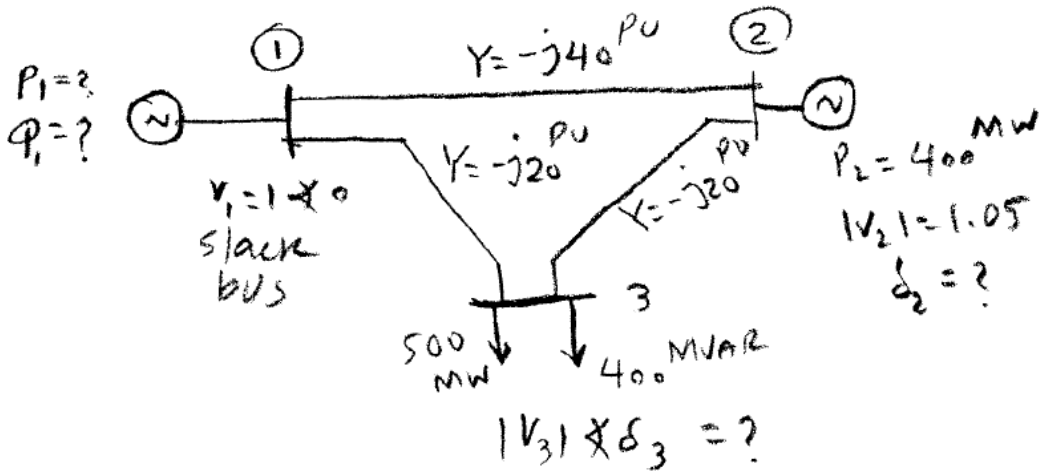
1- For the following system:

a) Use the Newton-Raphson method to find voltage angle at bus 2, and the voltage angel and magnitude for bus 3. Also find all the line flows. Start with $V^{(0)}_3 = 1\angle 0^\circ$ & $\delta^{(0)}_2 = 0$. Use a 100 MVA common power base.

b) Use DC-Power Flow and repeat part a.

c) Compare and discuses the results of parts 'a' and 'b'.



2-Write a computer program to solve the λ-iteration method using the following steps

1. Set an initial value of λ
2. Calculate the generated power from each plant that corresponds λ
3. Check unit limits. If limit is violated, set limit at lower or maximum values
3. Check that the demand against the total generation.
4. If generated power is less than demand increase λ and go to step 2
5. If generated power is more than demand decrease λ and go to step 2

Check your program with the following plant data.

The fuel –cost characteristics of the units are given by

$$C_1(P_{G1}) = 300 + 8.0P_{G1} + 0.0015P^2_{G1}$$

$$C_2(P_{G2}) = 450 + 8.0P_{G2} + 0.0005P^2_{G2}$$

$$C_2(P_{G3}) = 700 + 7.5P_{G3} + 0.0010P^2_{G3}$$

The generator limits are

$320 \text{ MW} \le P_{G1} \le 800 \text{ MW}$

$300 \text{ MW} \le P_{G2} \le 1200 \text{ MW}$

$275 \text{ MW} \le P_{G3} \le 1100 \text{ MW}$

Find the optimal dispatch for a load P_D = 2000 MW.