

Comparism of results from MATLAB-FOMCOM AND PYTHON-FOMCON

3 functions were used to test. These functions are same function that is loaded when the command 'loadset' is used in fomcon matlab tool box.

The 3 functions are g1, g2, g3 represented in matlab are below

```
>> G1.display
Fractional-order transfer function:
          1
-----
14994s^{1.31}+6009.5s^{0.97}+1.69
>> G2.display
Fractional-order transfer function:
          1
-----
0.8s^{2.2}+0.5s^{0.9}+1
>> G3.display
Fractional-order transfer function:
          -2s^{0.63}+4
-----
2s^{3.501}+3.8s^{2.42}+2.6s^{1.798}+2.5s^{1.31}+1.5
```

The 3 functions are represented in python are below:

```
In[3]: from fotf import *
...: import numpy as np
...: t = np.linspace(0,30,300)
...: g1 = newfotf(1., '14994s^{1.31}+6009.5s^{0.97}+1.69', 0)
...: g2 = newfotf(1., '0.8s^{2.2}+0.5s^{0.9}+1', 0)
...: g3 = newfotf('-2s^{0.63}+4', '2s^{3.501}+3.8s^{2.42}+2.6s^{1.798}+2.5s^{1.31}+1.5', 0)
```

```
In[4]: print(g1)
...: print(g2)
...: print(g3)

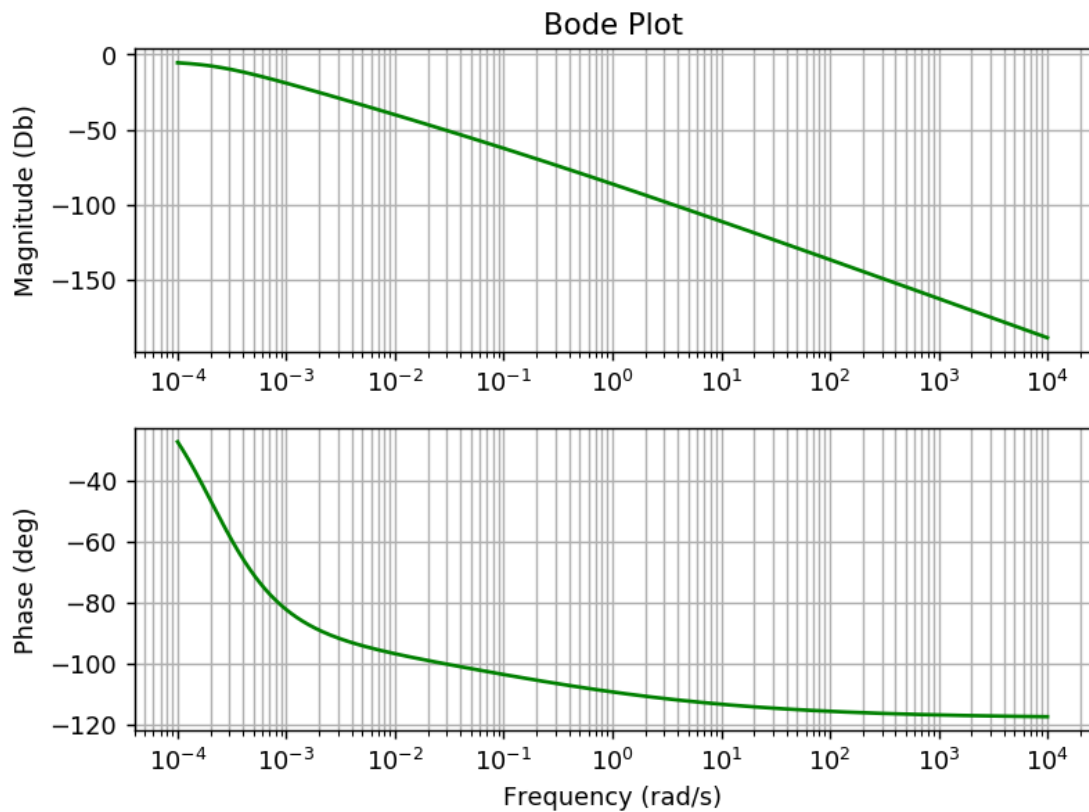
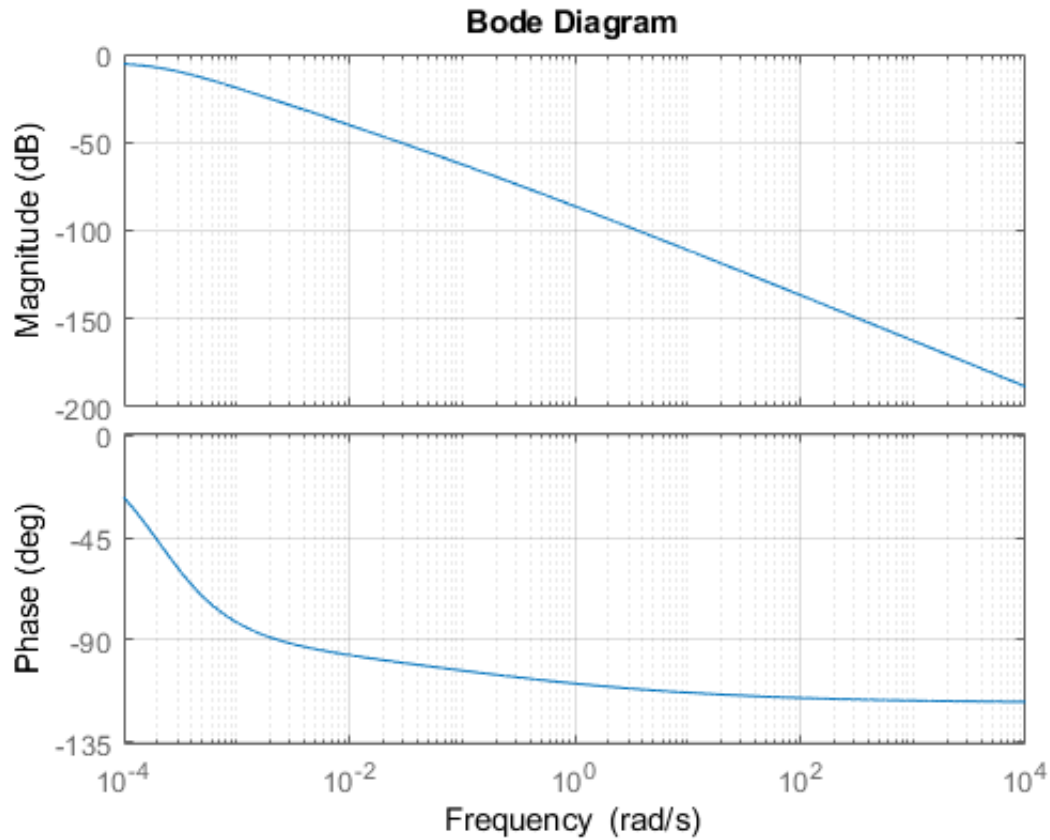
          1
-----
14994s^{1.31} + 6009.50s^{0.97} + 1.69

          1
-----
0.80s^{2.20} + 0.50s^{0.90} + 1

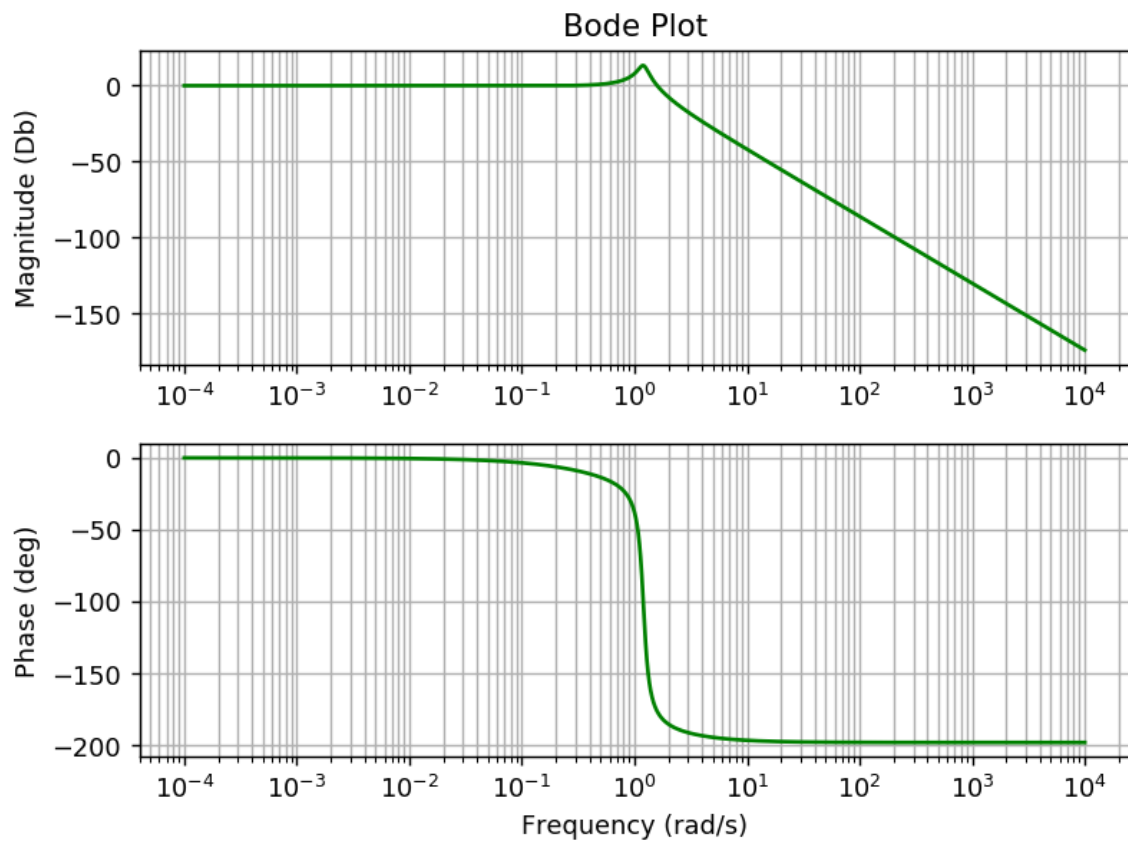
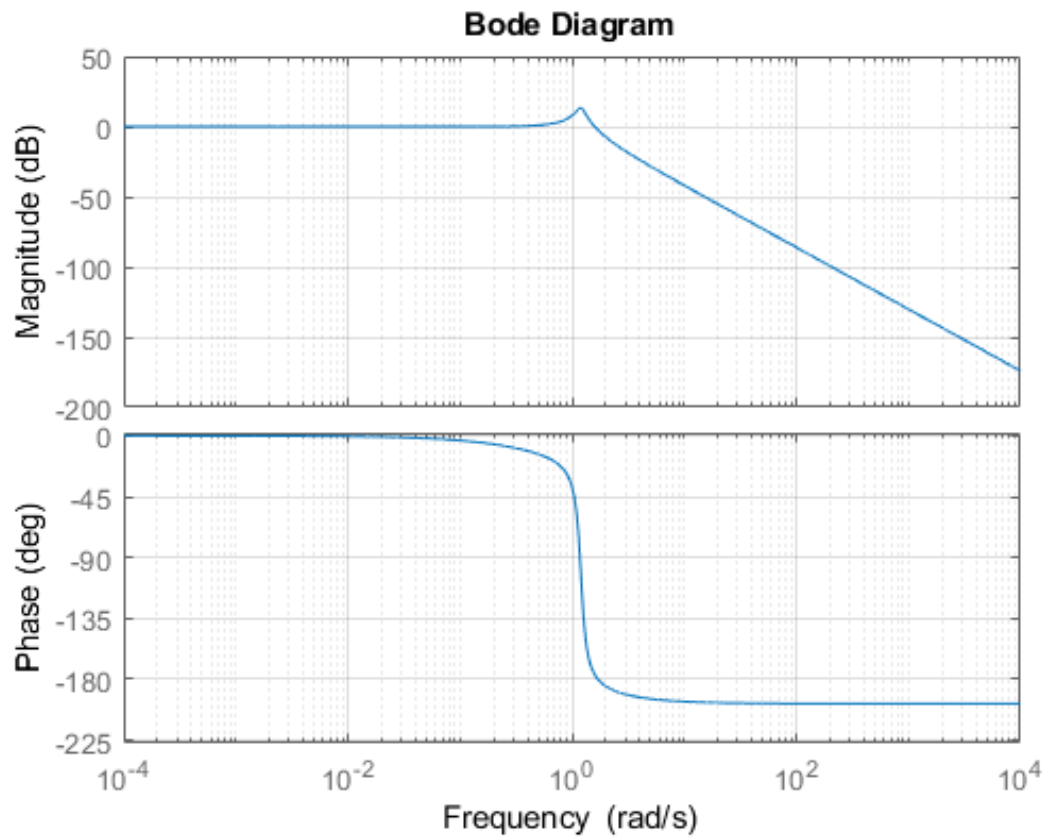
          -2s^{0.63} + 4
-----
2s^{3.50} + 3.80s^{2.42} + 2.60s^{1.80} + 2.50s^{1.31} + 1.50
```

FREQUENCY RESPONSE COMPARISM

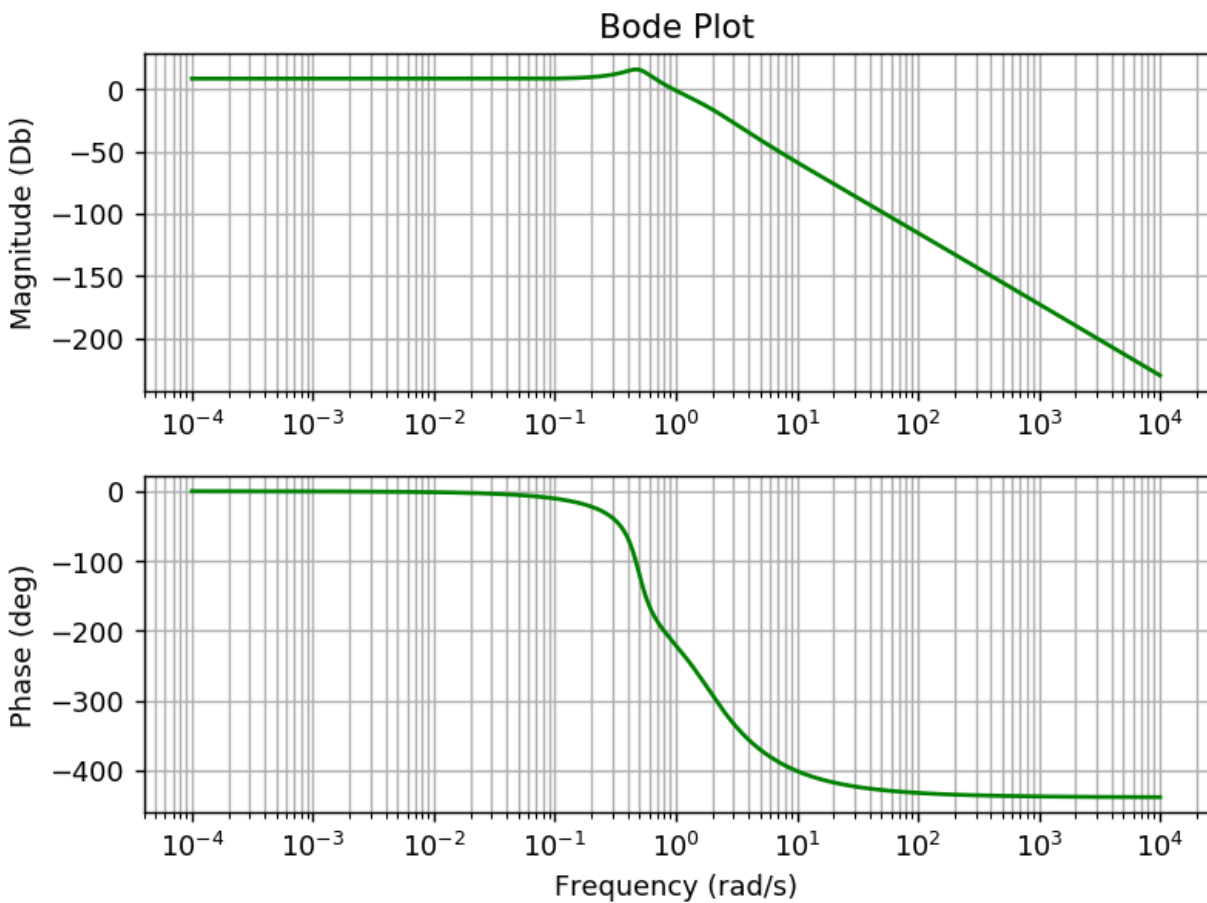
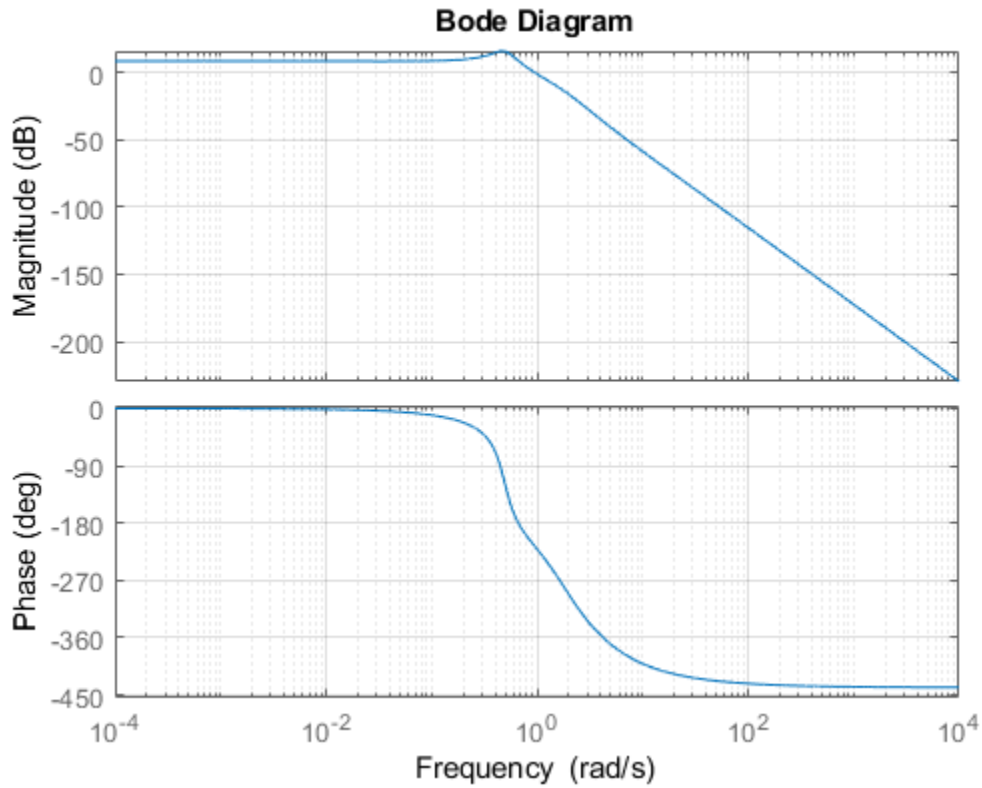
The Frequency response for g1 on MATLAB (first figure) then on python (Second figure)



The Frequency response for g2 on MATLAB (first figure) then on python (Second figure)

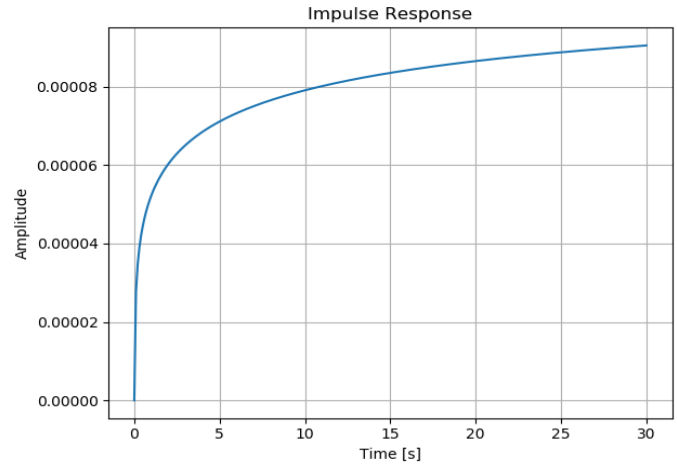
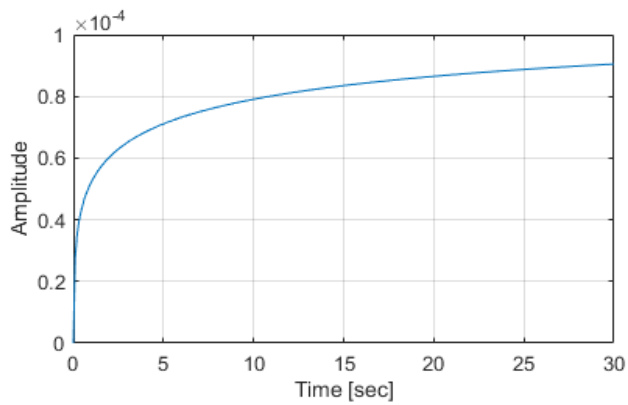


The Frequency response for g3 on MATLAB (first figure) then on python (Second figure)

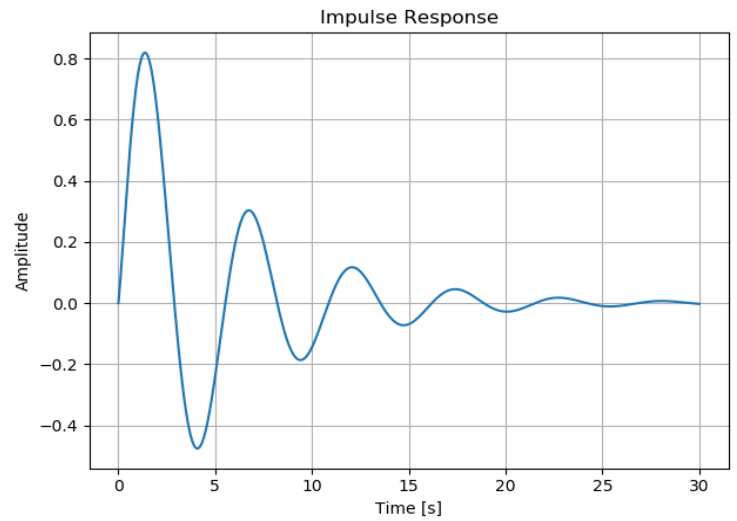
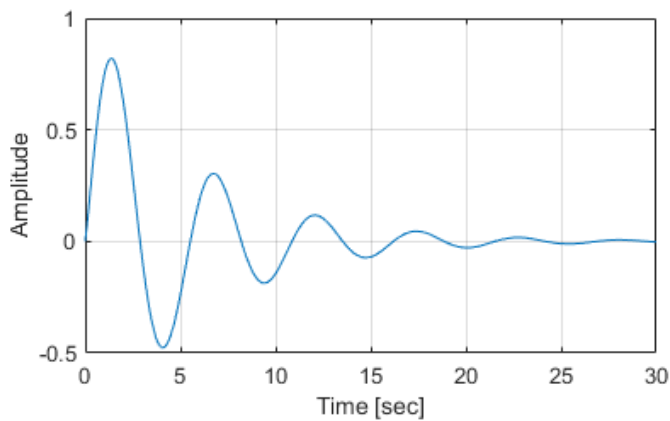


IMPULSE COMPARISM

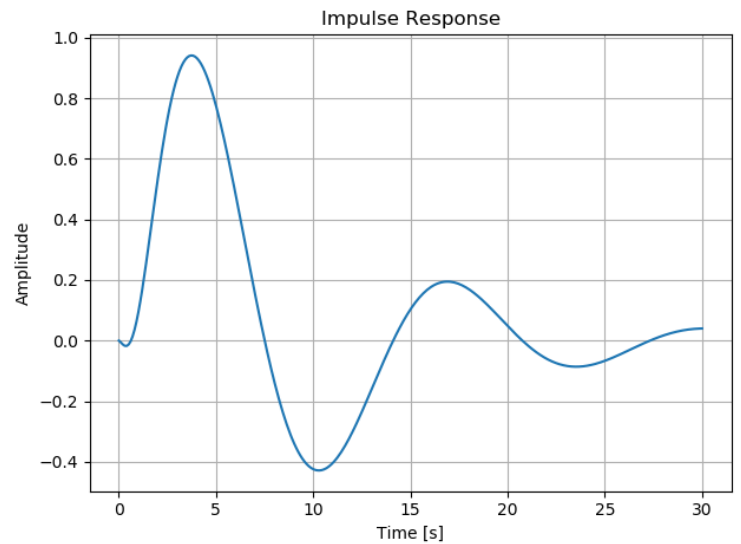
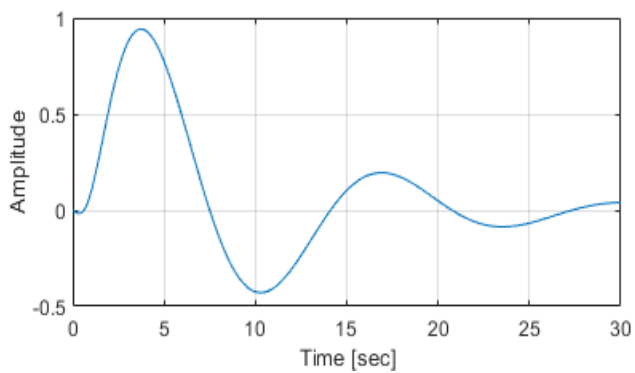
Impulse response for g1 on MATLAB (left) then on python (right)



Impulse response for g2 on MATLAB (left) then on python (right)

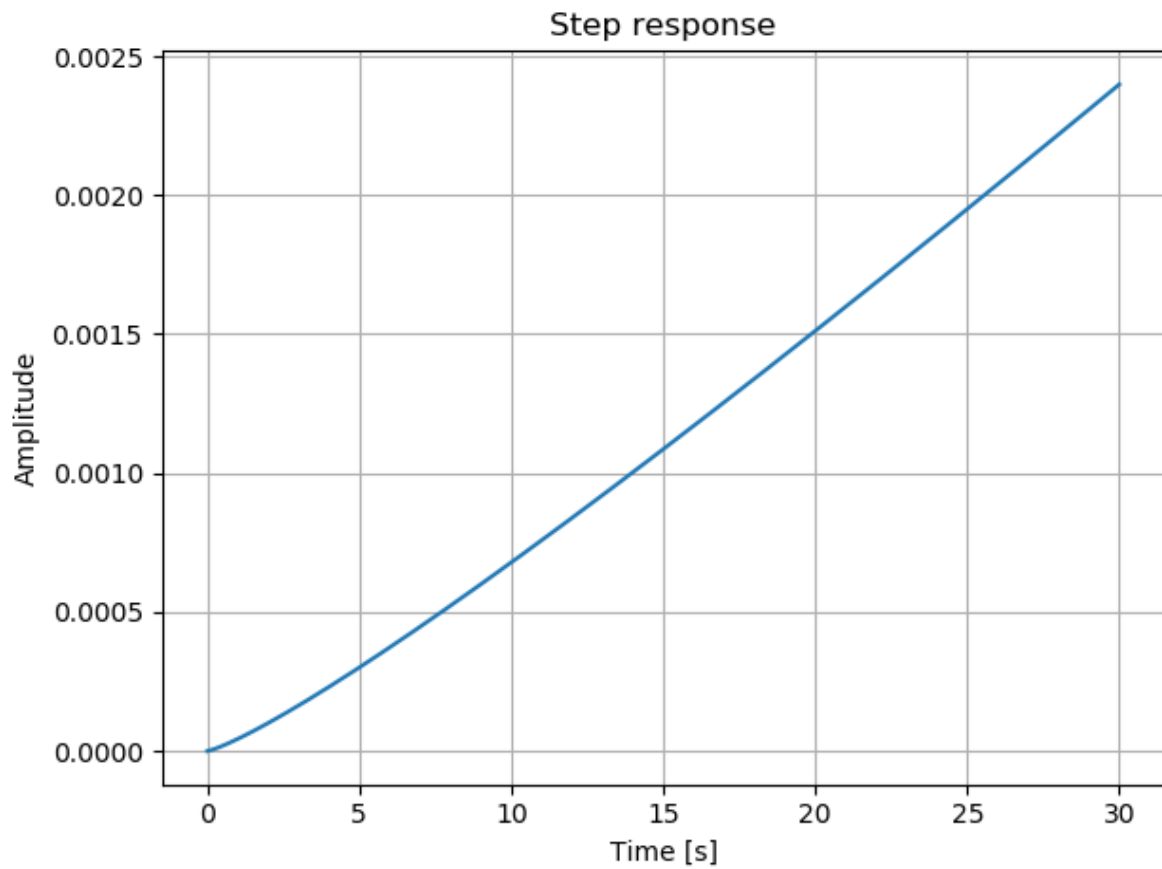
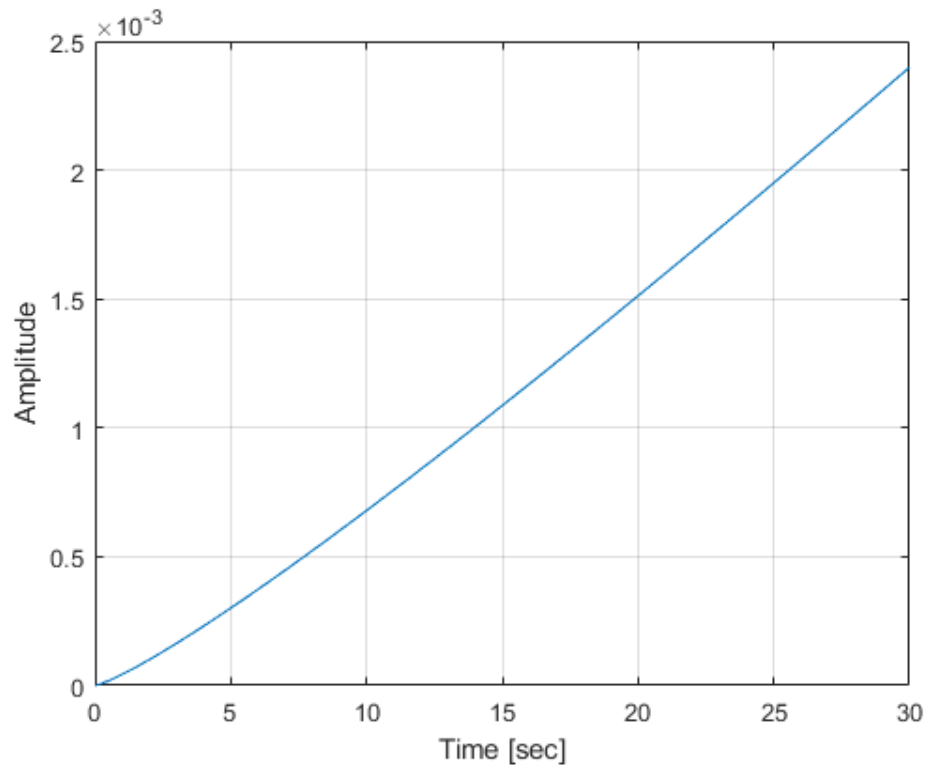


Impulse response for g3 on MATLAB (left) then on python (right)

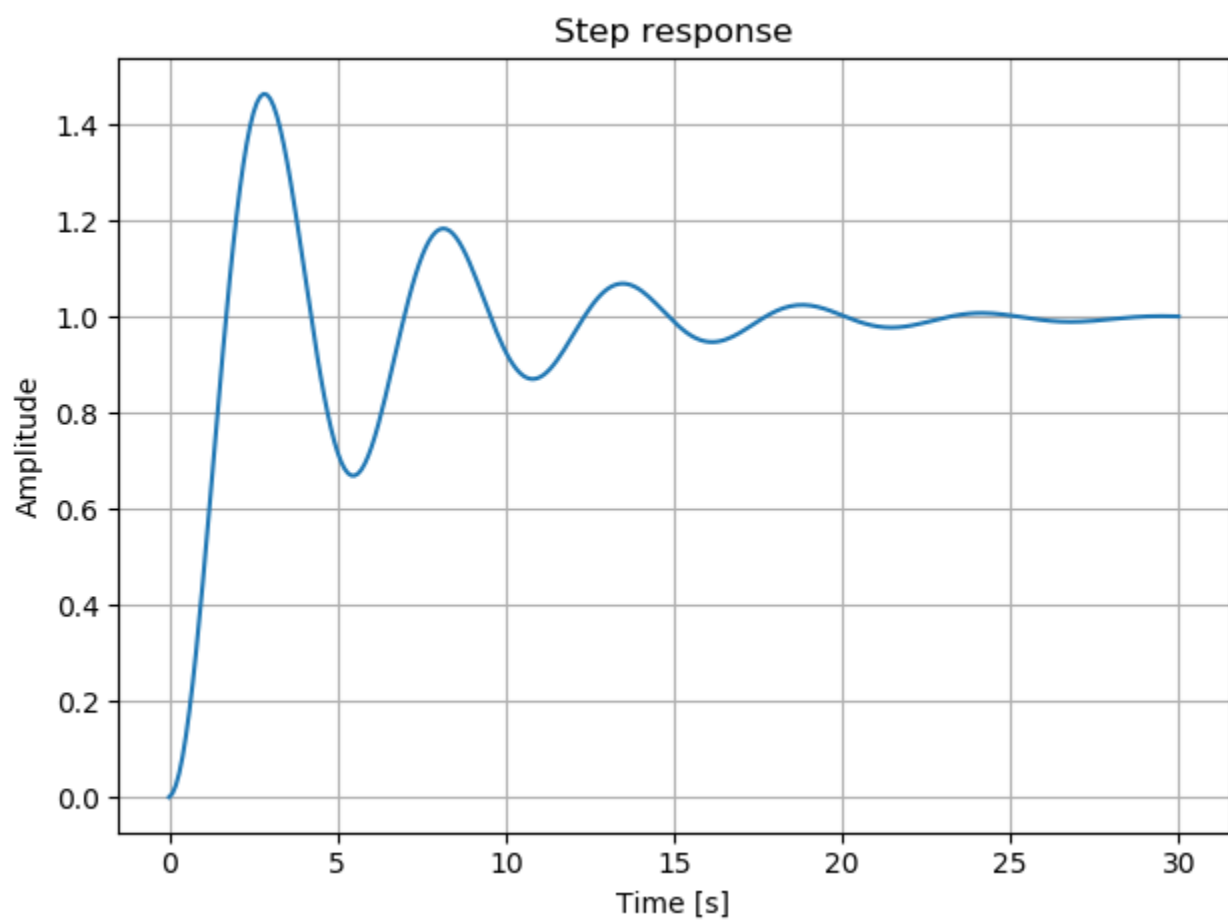
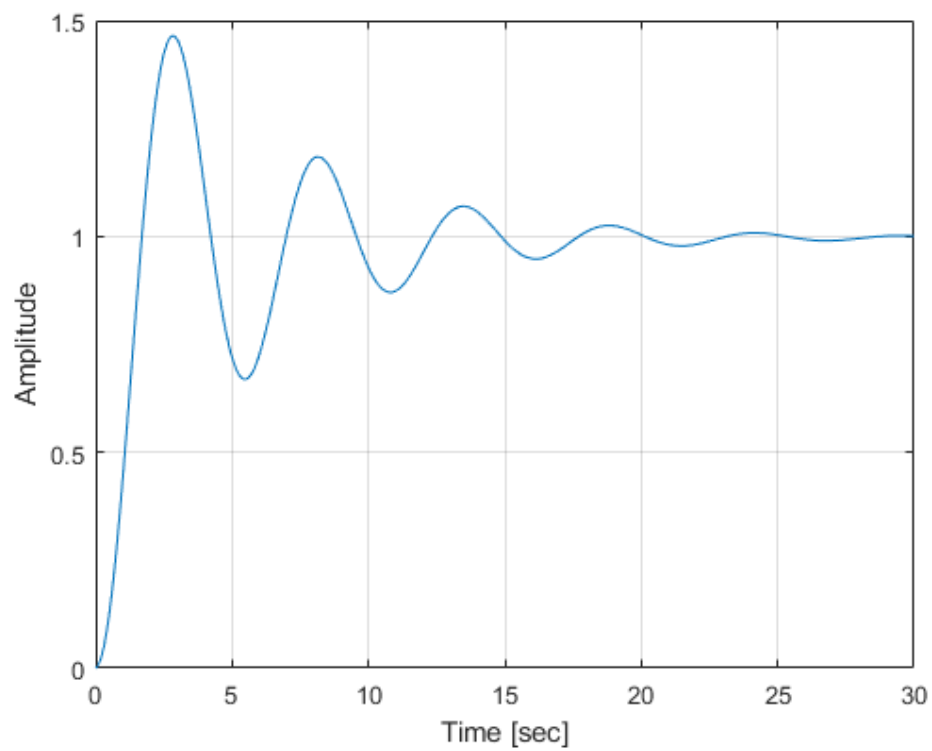


STEP RESPONSE COMPARISM

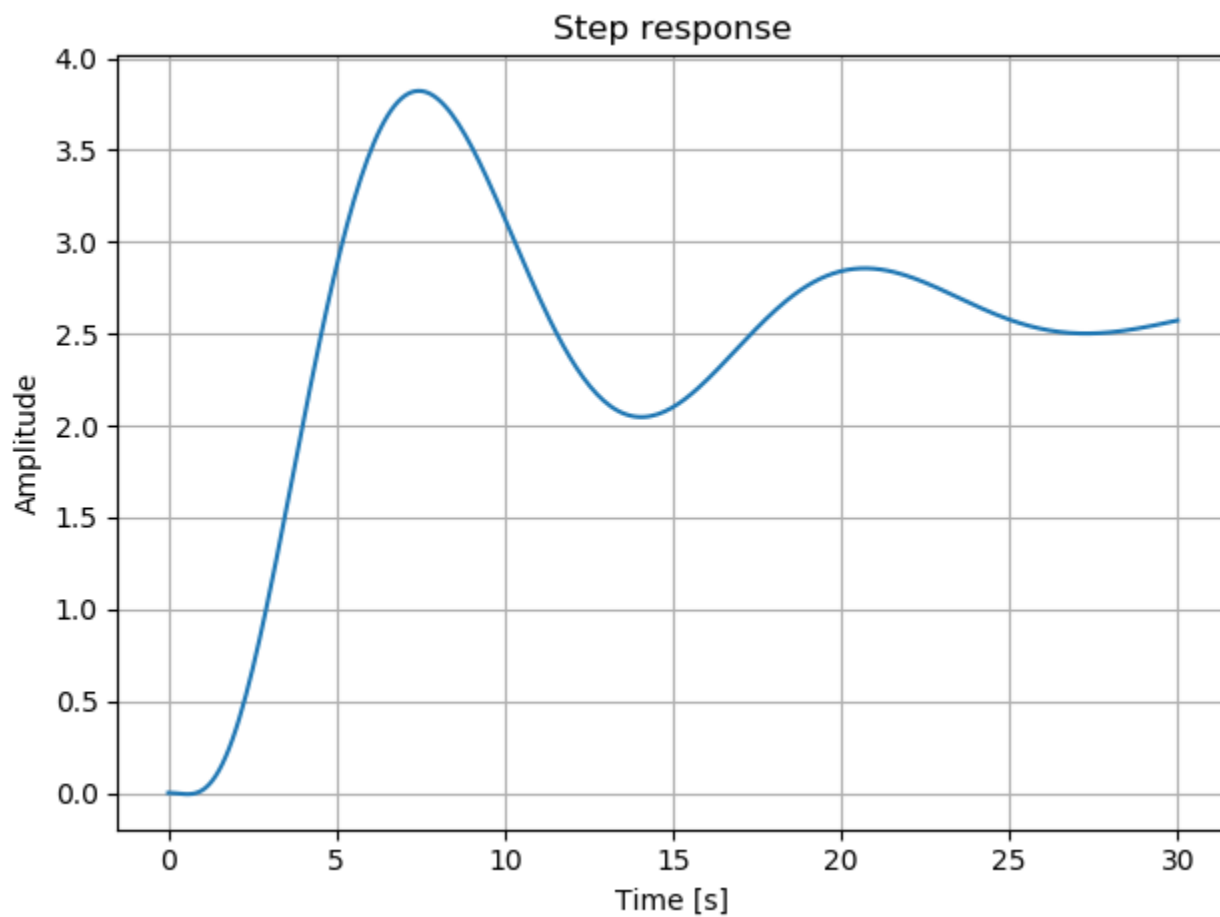
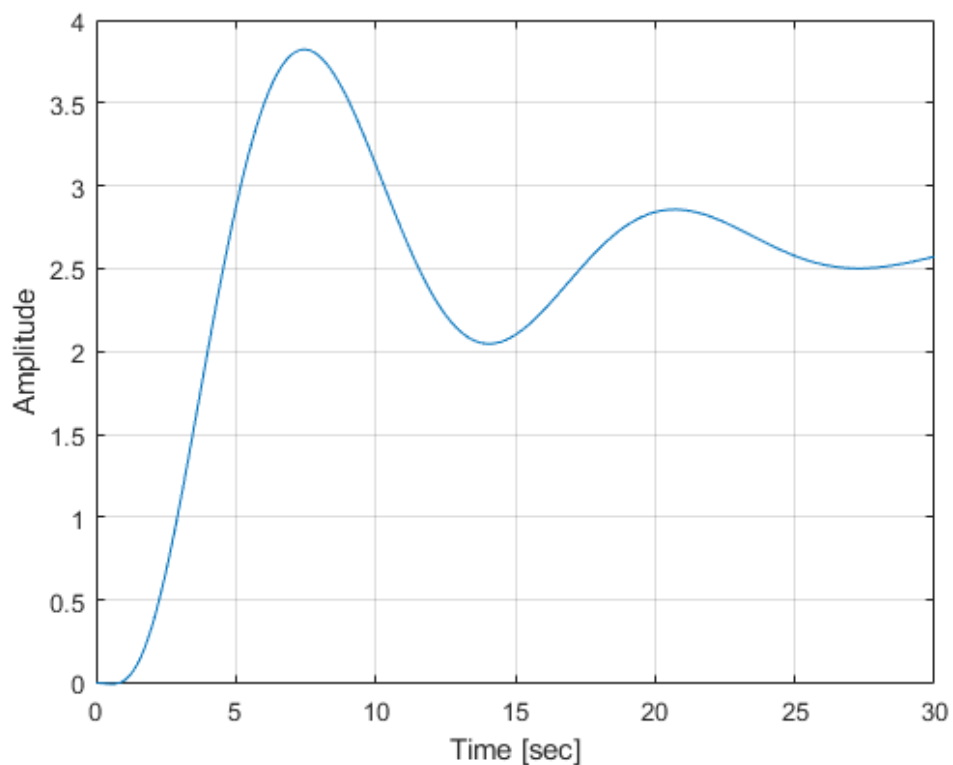
Step response for g1 on MATLAB (1st Figure) then on python (2nd Figure)



Step response for g2 on MATLAB (1st Figure) then on python (2nd Figure)

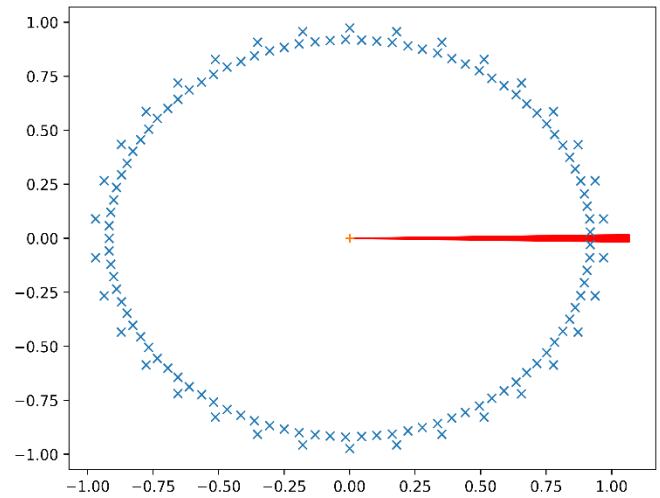
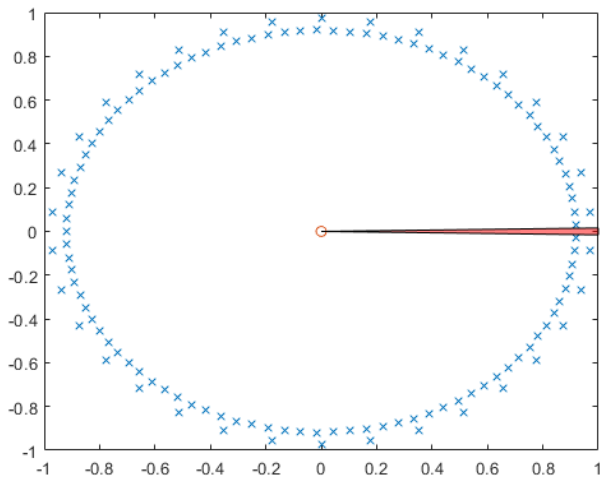


Step response for g3 on MATLAB (1st Figure) then on python (2nd Figure)

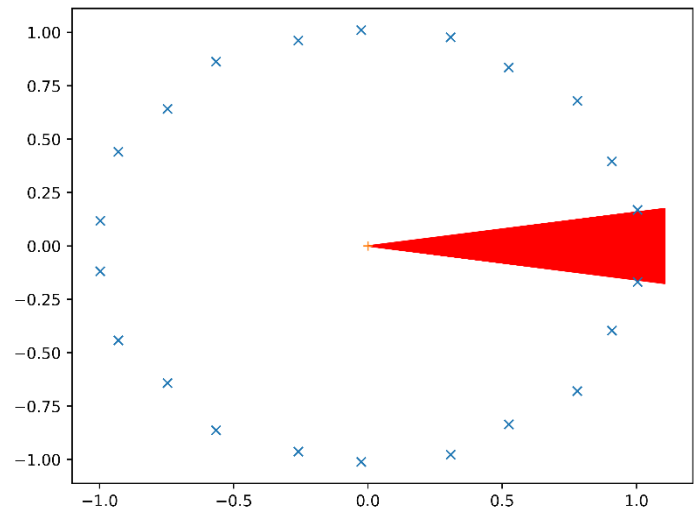
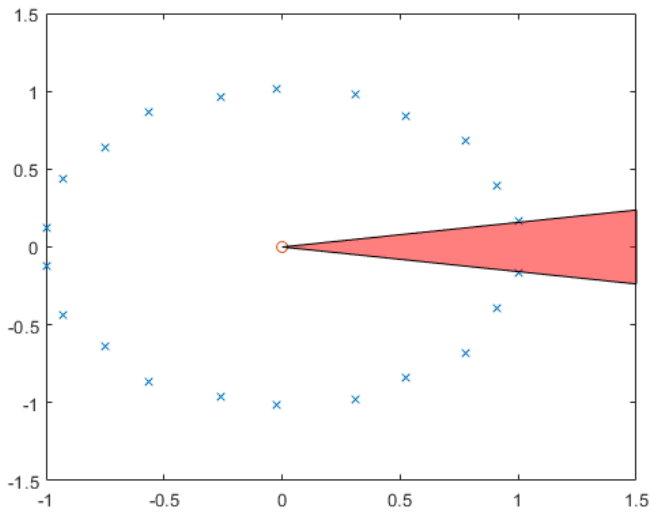


STABILITY COMPARISM

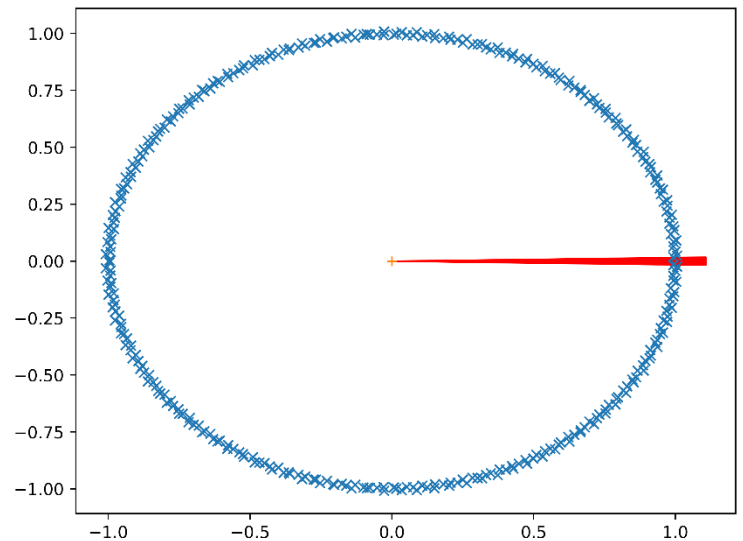
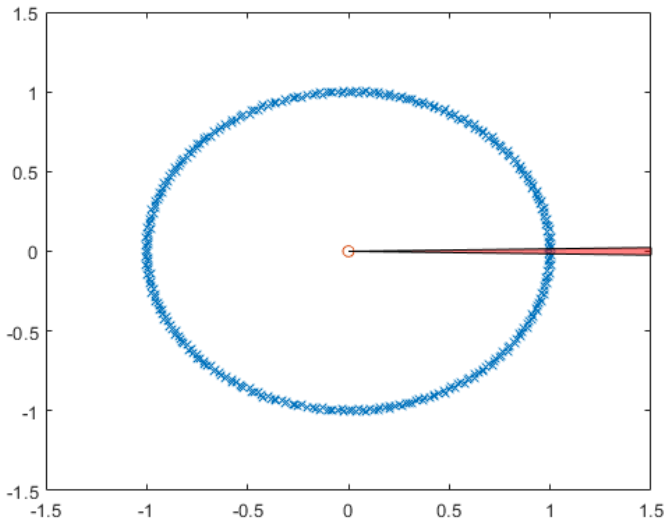
Stability check for g1 on MATLAB (left) then on python (right) $q = 0.01$



Stability check for g2 on MATLAB (left) then on python (right) $q = 0.1$



Stability check for g3 on MATLAB (left) then on python (right) $q = 0.01$



CONCLUSION

From the comparison, same results are obtained from python as compared to MATLAB.

Kindly advise how next to proceed.