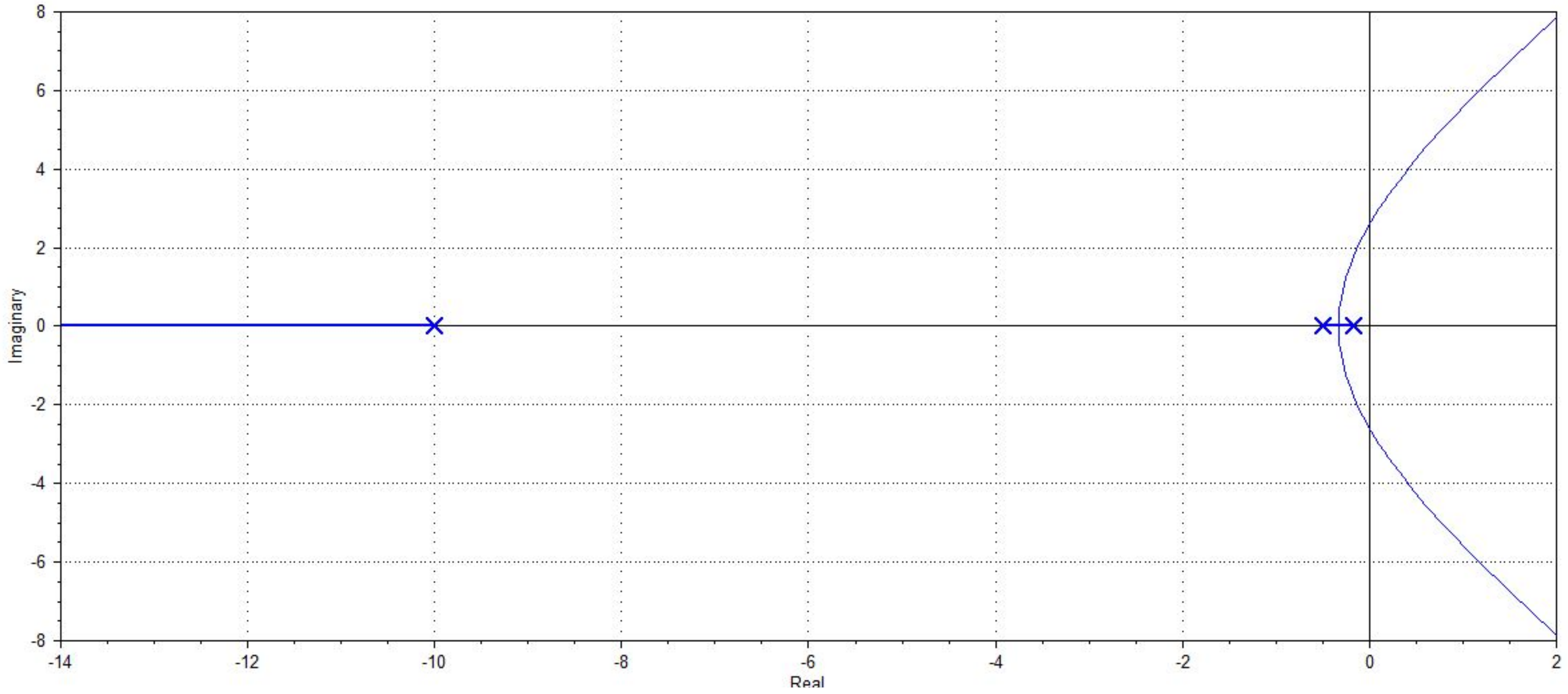
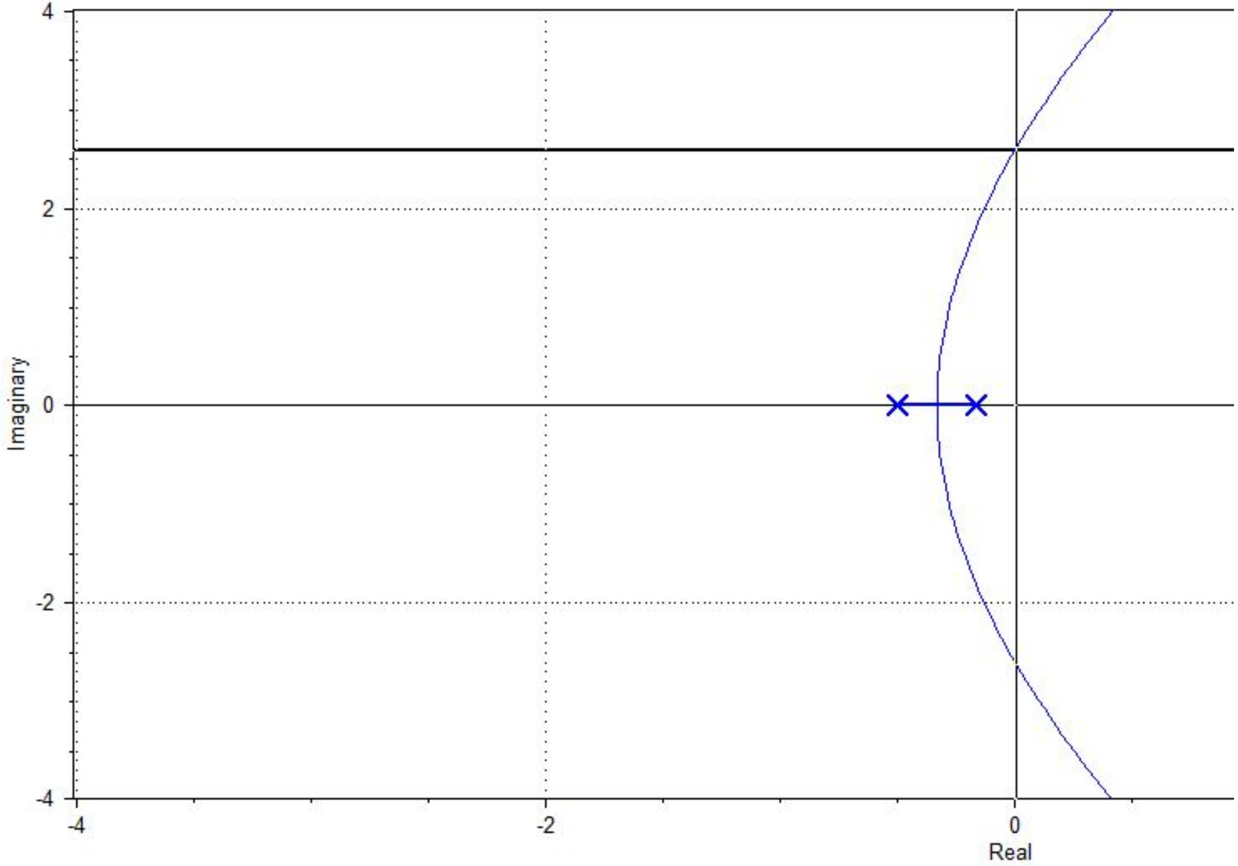
GO

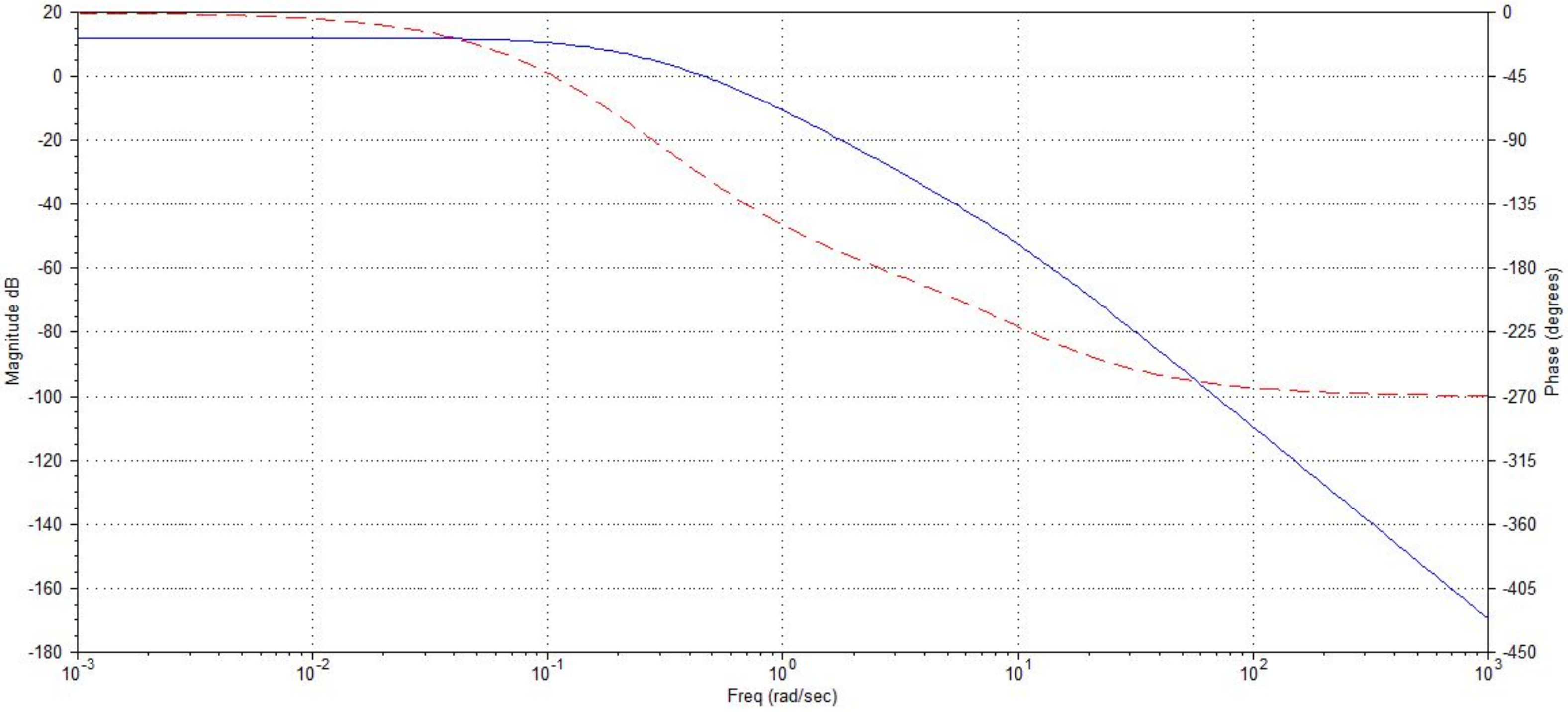
Raíces go



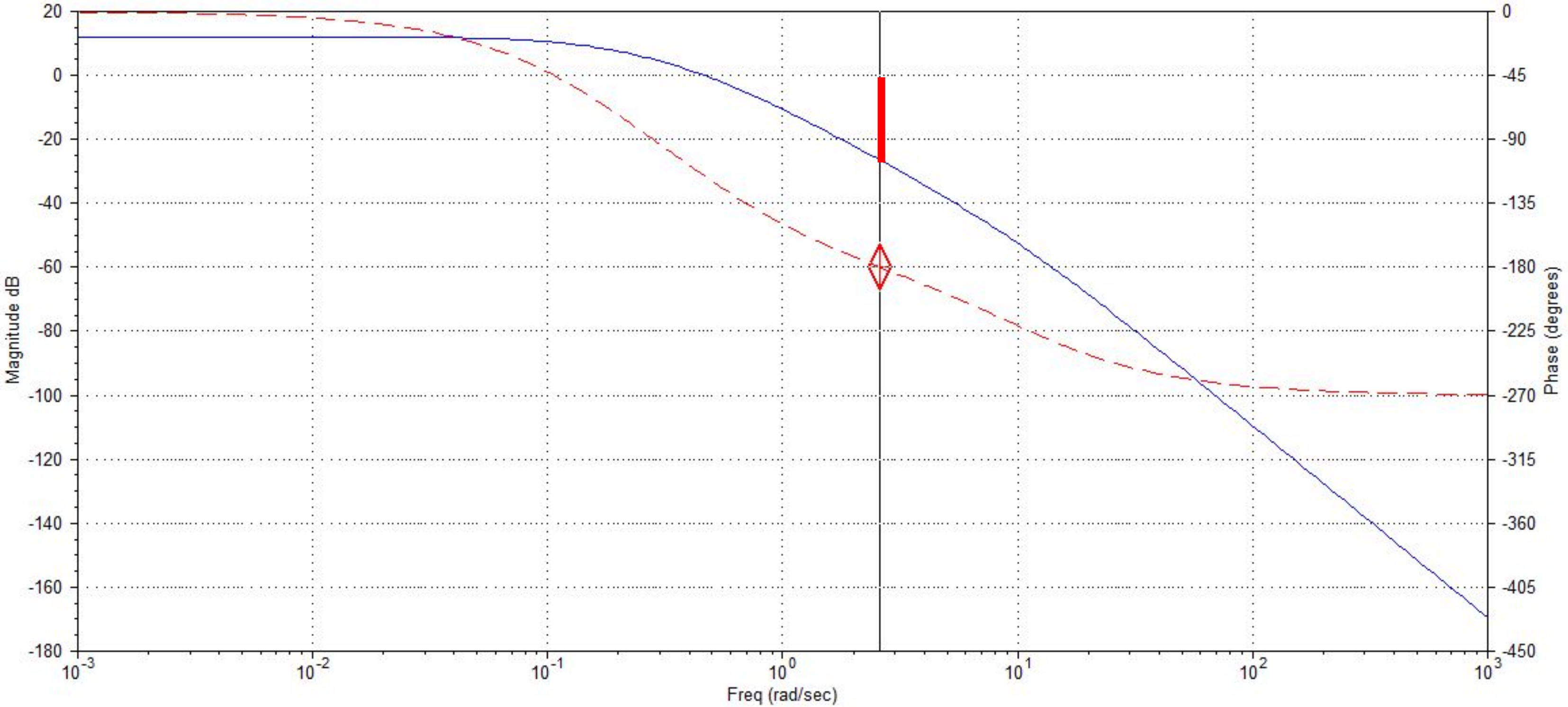


s= 0,005352 +2,59j (Mag= 2,59, Zeta= -0,002066)
gain= 21,24 -0,1204j (Mag= 21,24, Phase= -0,3248 deg)

Bode go

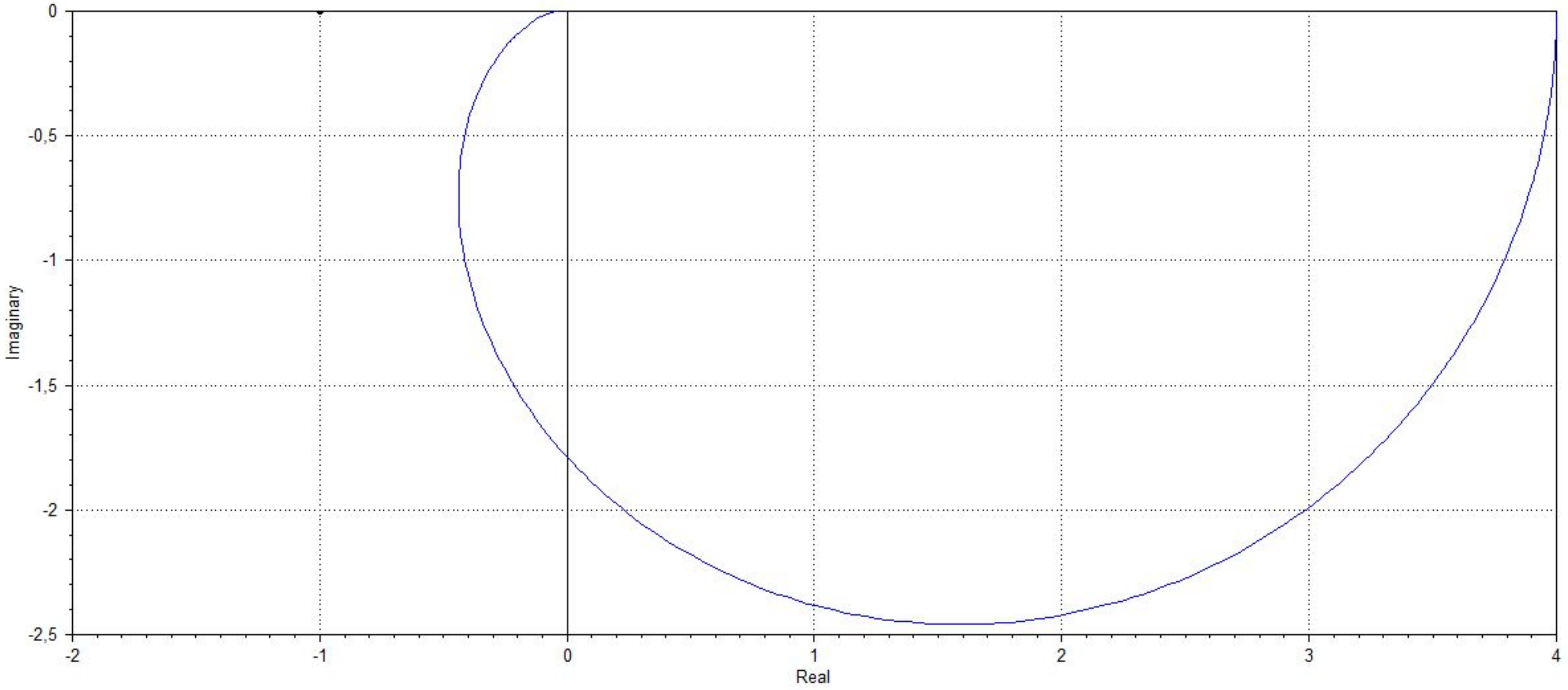


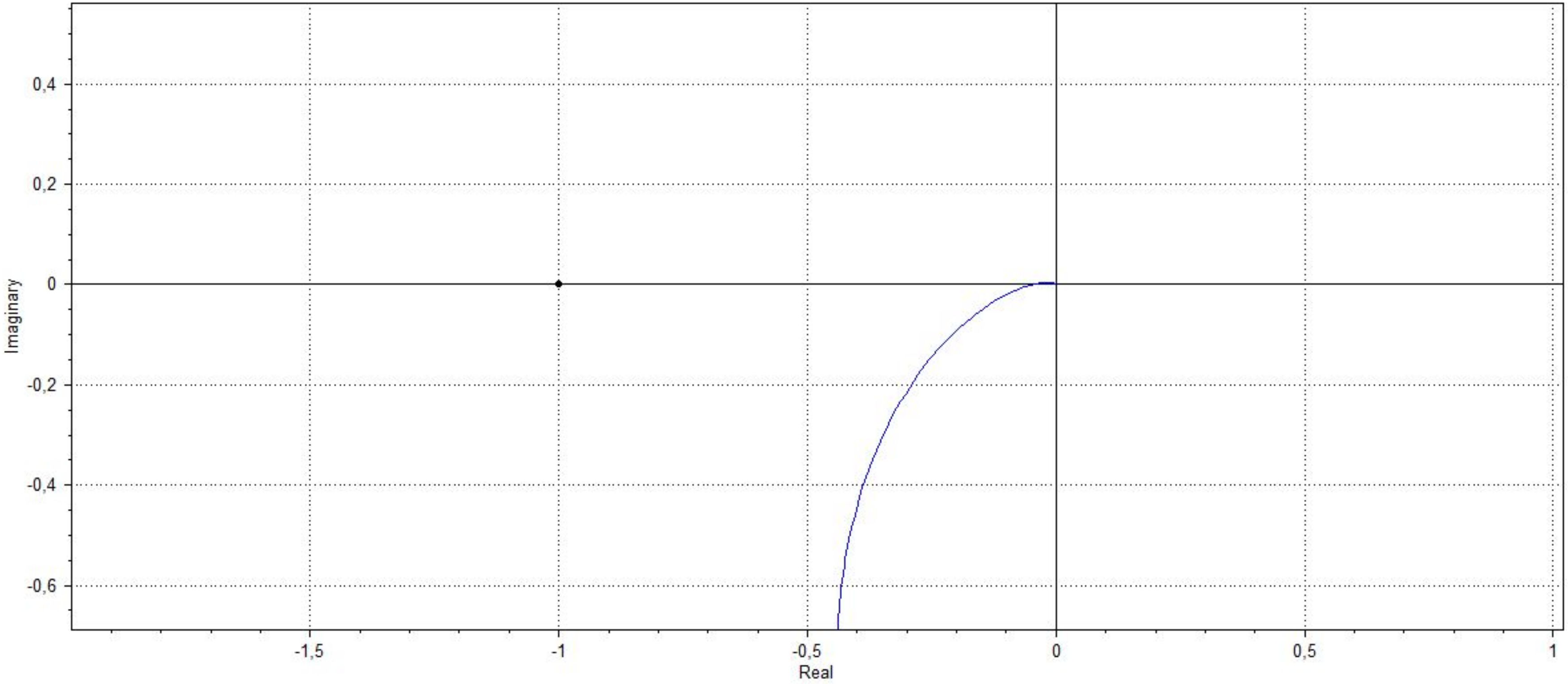
Magnitude dB
Phase (degrees)
Freq (rad/sec)
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
0
-45
-90
-135
-180
-225
-270
-315
-360
-405
-450
10^{-3}
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
10^{3}



20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
Magnitude dB
0
-45
-90
-135
-180
-225
-270
-315
-360
-405
-450
Phase (degrees)
10^{-3}
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
10^{3}
Freq (rad/sec)

Nyquist go

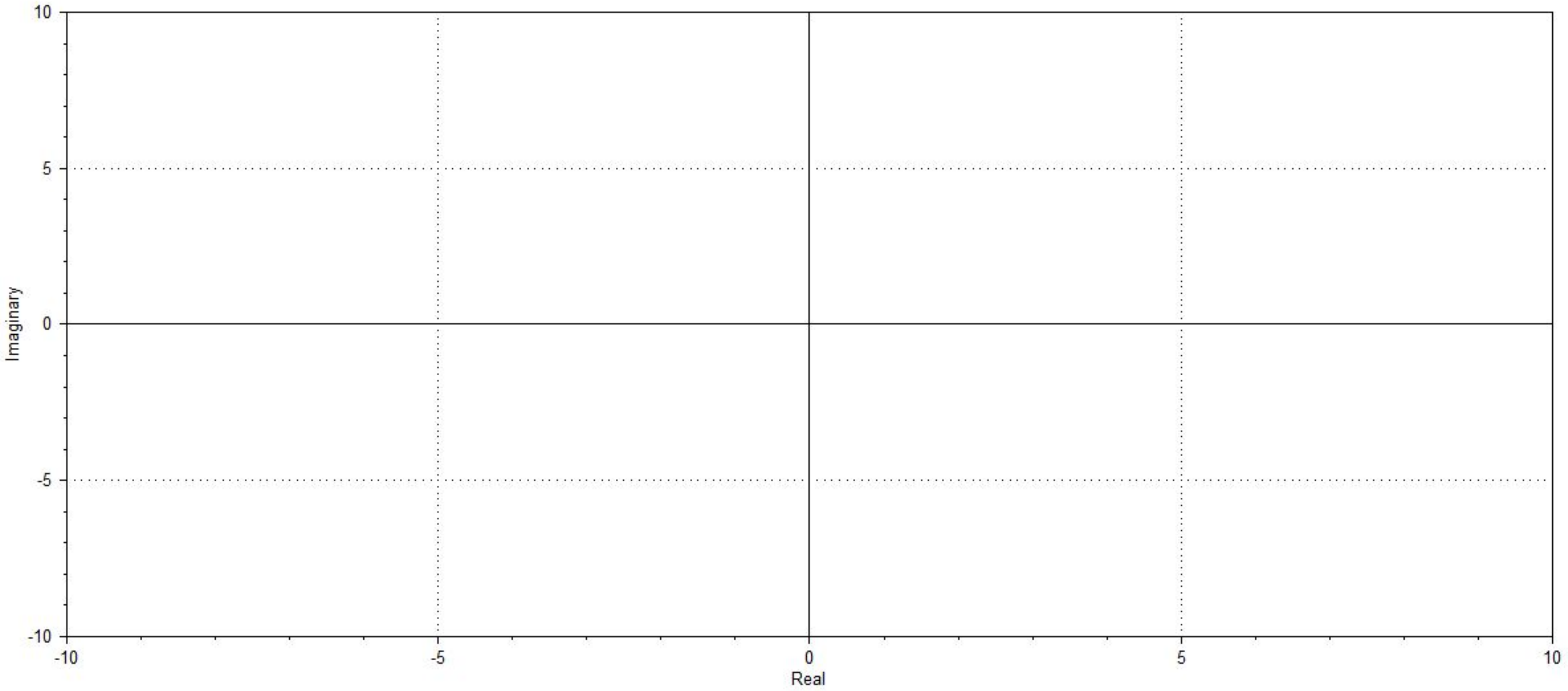



0,4
0,2
0
-0,2
-0,4
-0,6
Imaginary
-1,5
-1
-0,5
0
0,5
1
Real

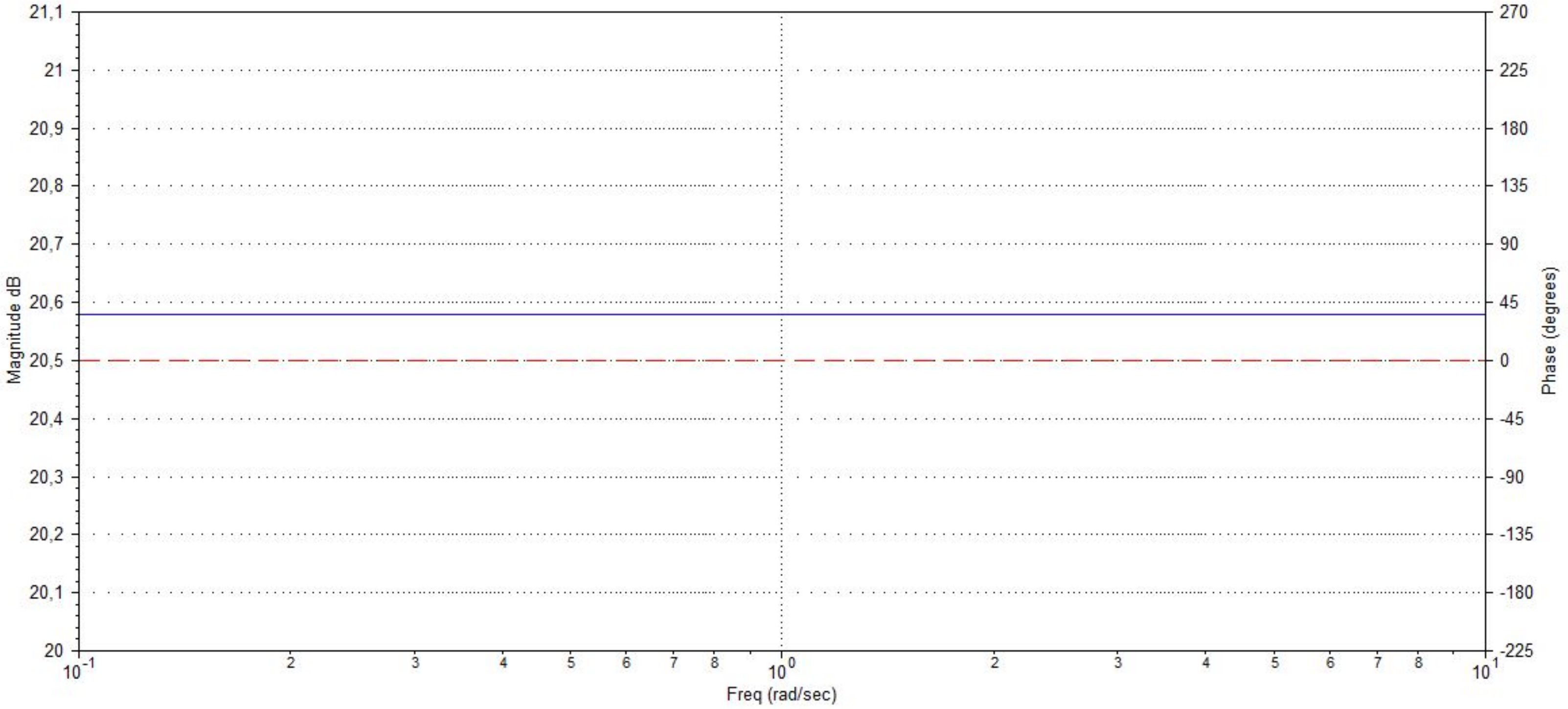
Raices	$\frac{1}{6}$, $\frac{1}{2}$ y 10
Ku	21,35
wu	3/2 * (3)^½

Gp

Raices Gp

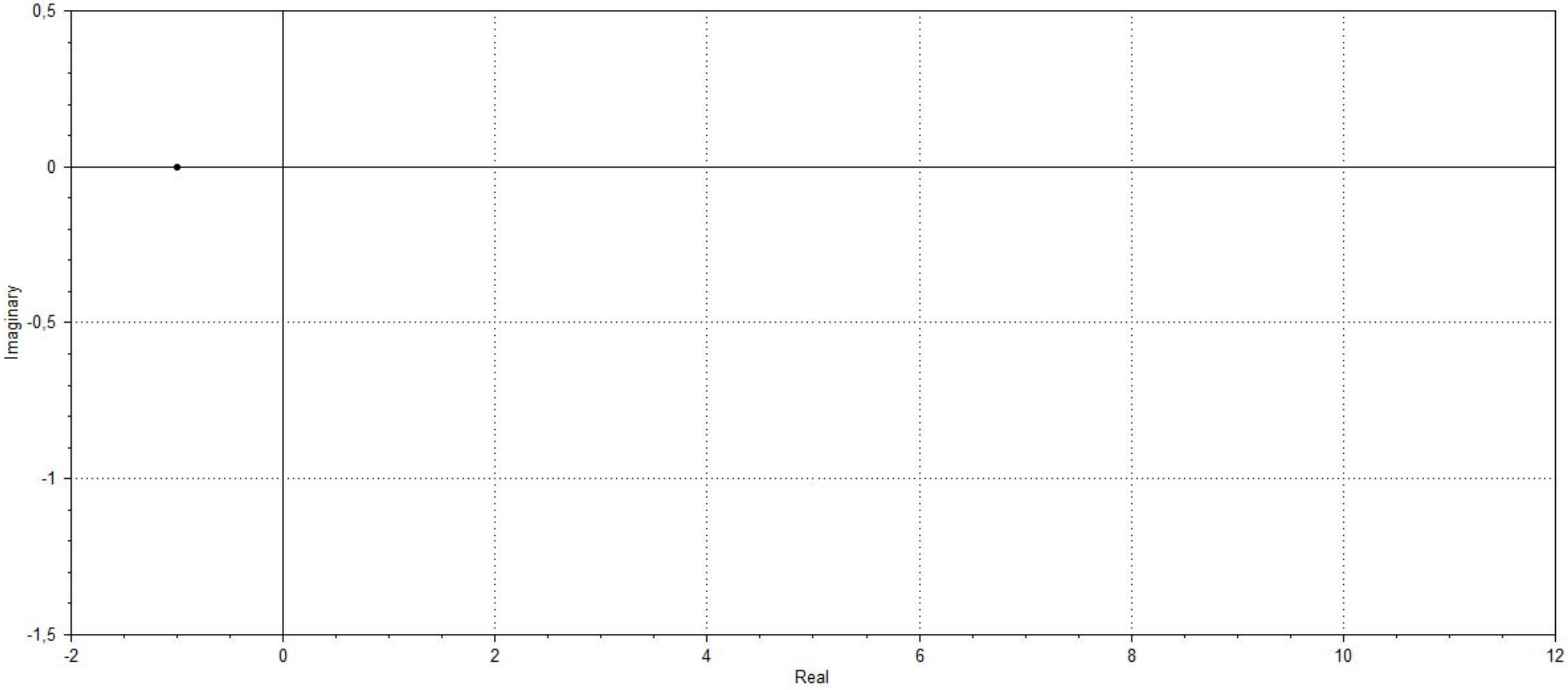


Bode Gp



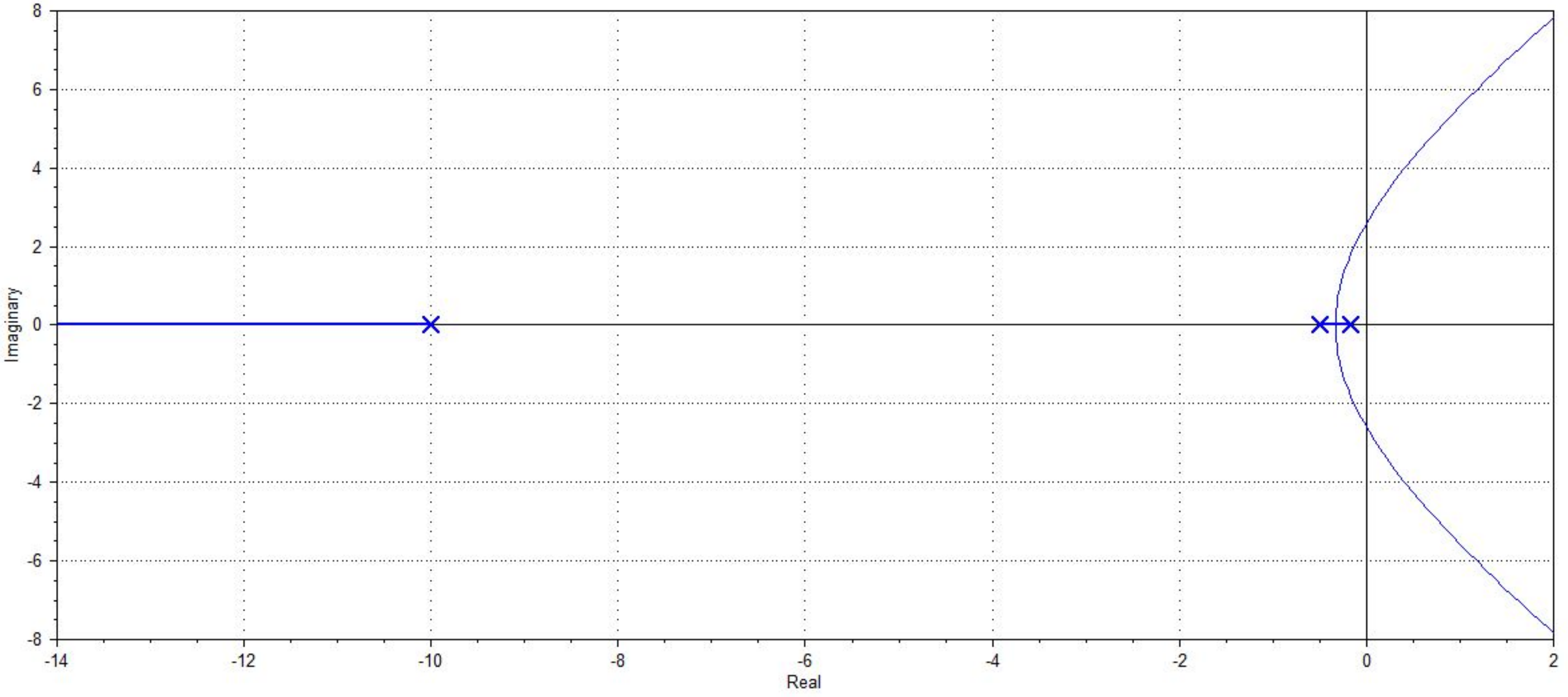
Magnitude dB
21,1
21
20,9
20,8
20,7
20,6
20,5
20,4
20,3
20,2
20,1
20
Phase (degrees)
270
225
180
135
90
45
0
-45
-90
-135
-180
-225
Freq (rad/sec)
10^{-1}
2
3
4
5
6
7
8
10^{0}
2
3
4
5
6
7
8
10^{1}

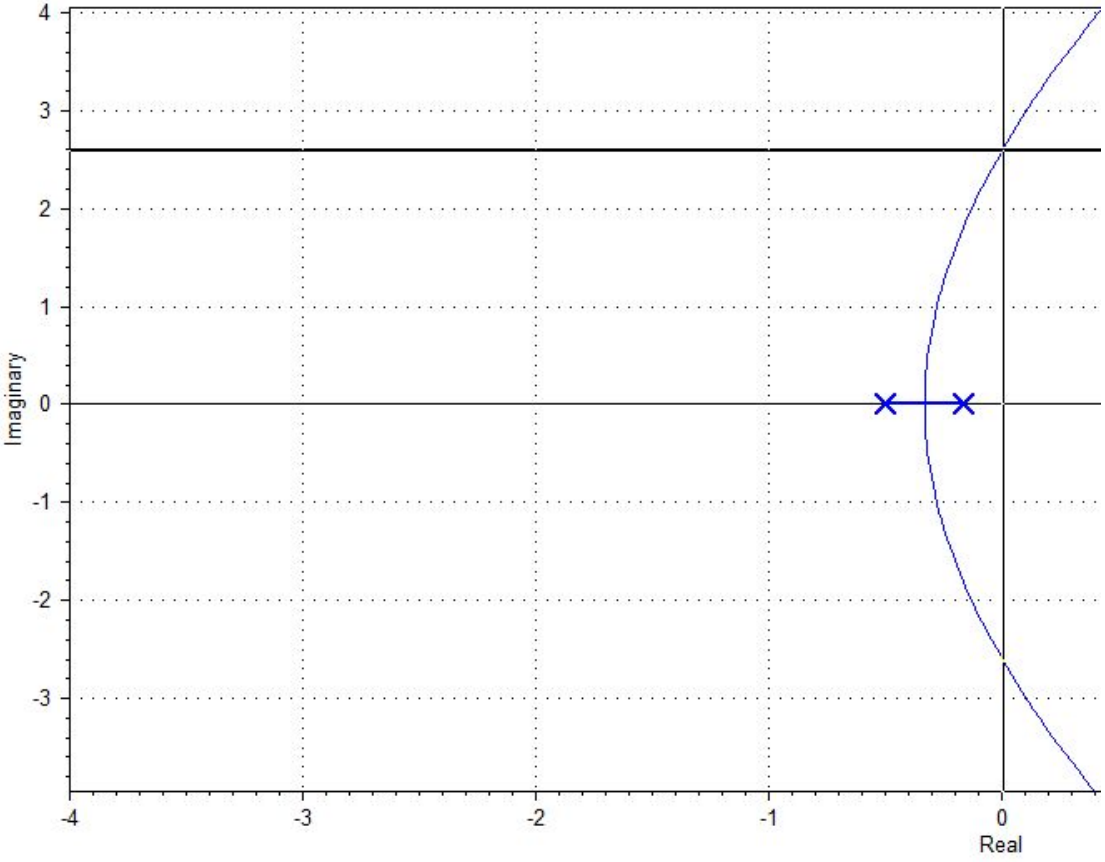
Nyquist Gp



Go*Gp

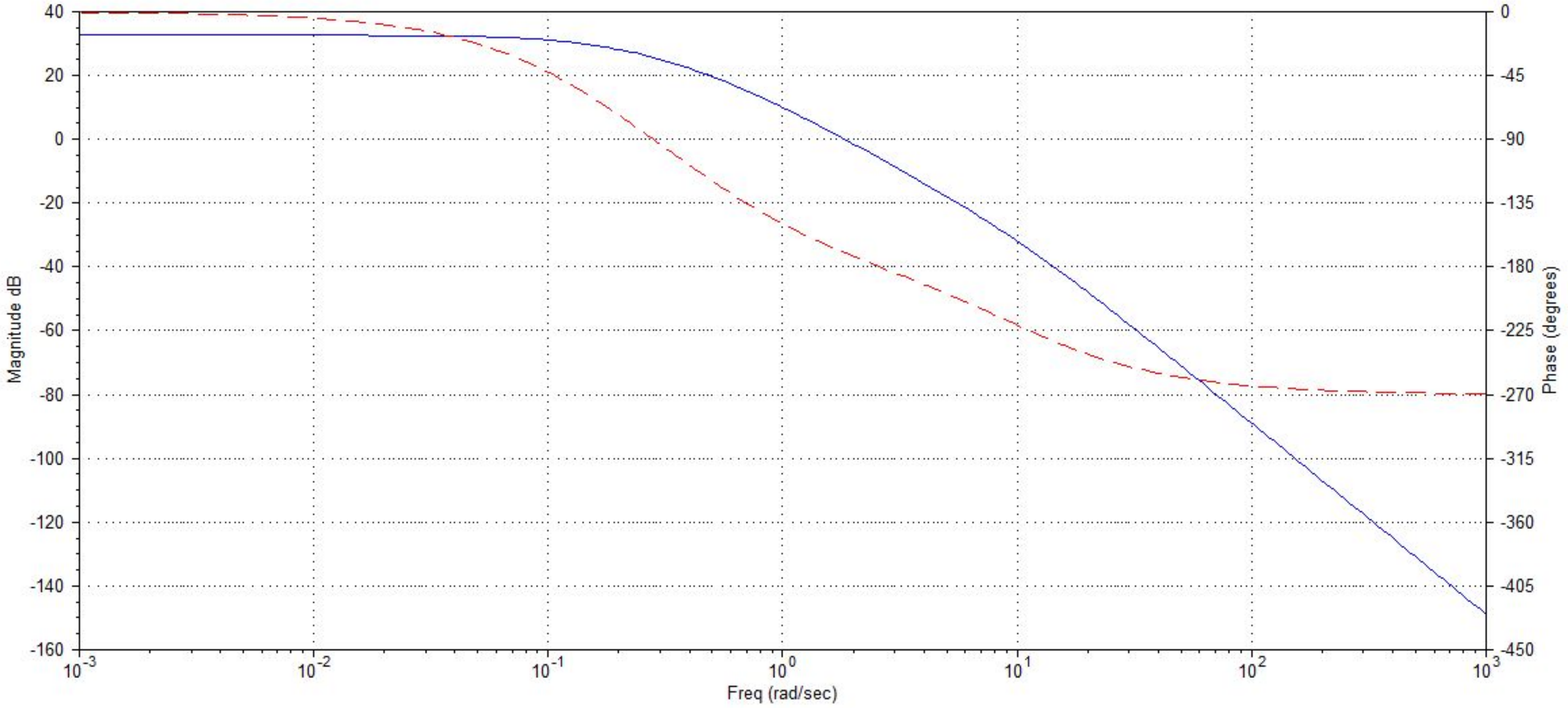
Raices Go*Gp



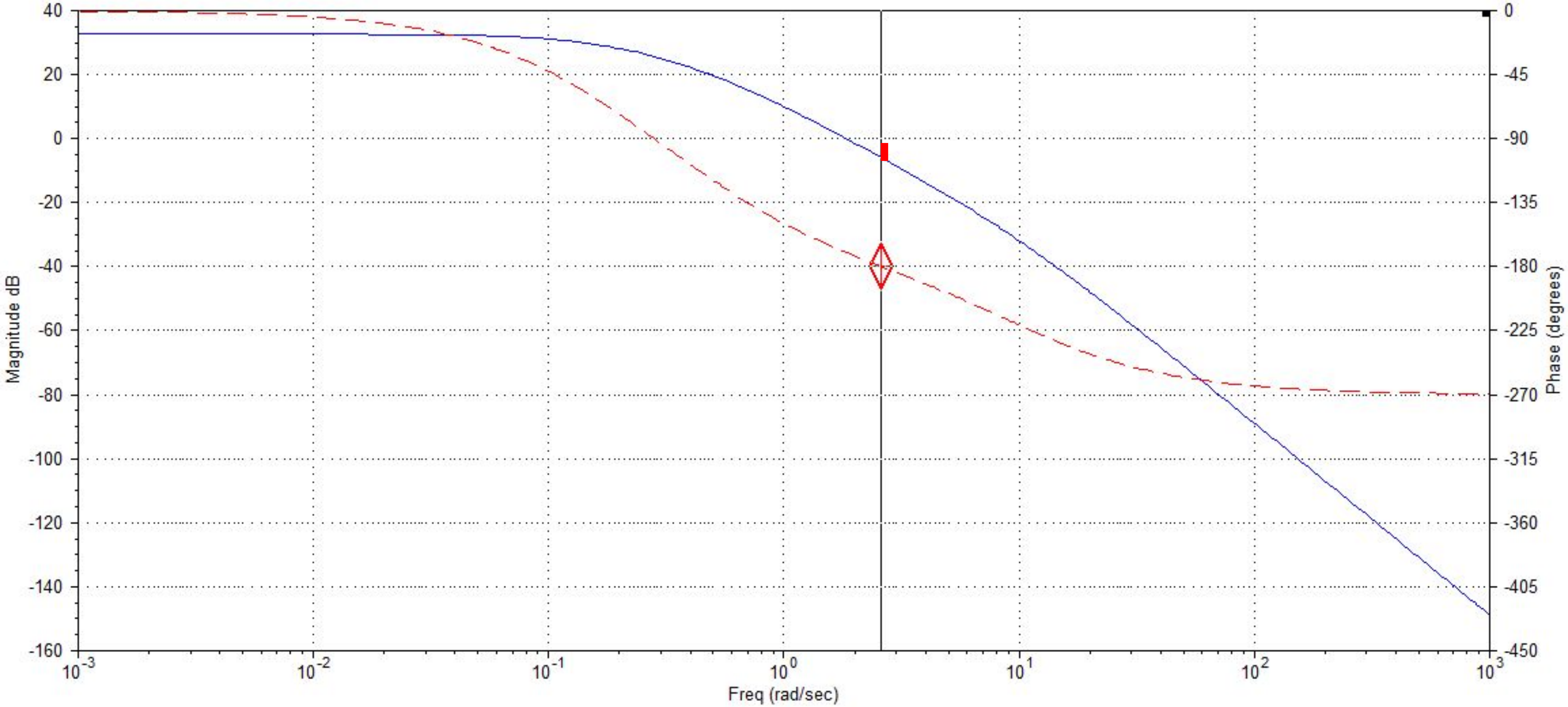


s= 0,005352 +2,59j (Mag= 2,59, Zeta= -0,002066)
gain= 1,987 -0,01126j (Mag= 1,987, Phase= -0,3248 deg)

Bode Go*Gp

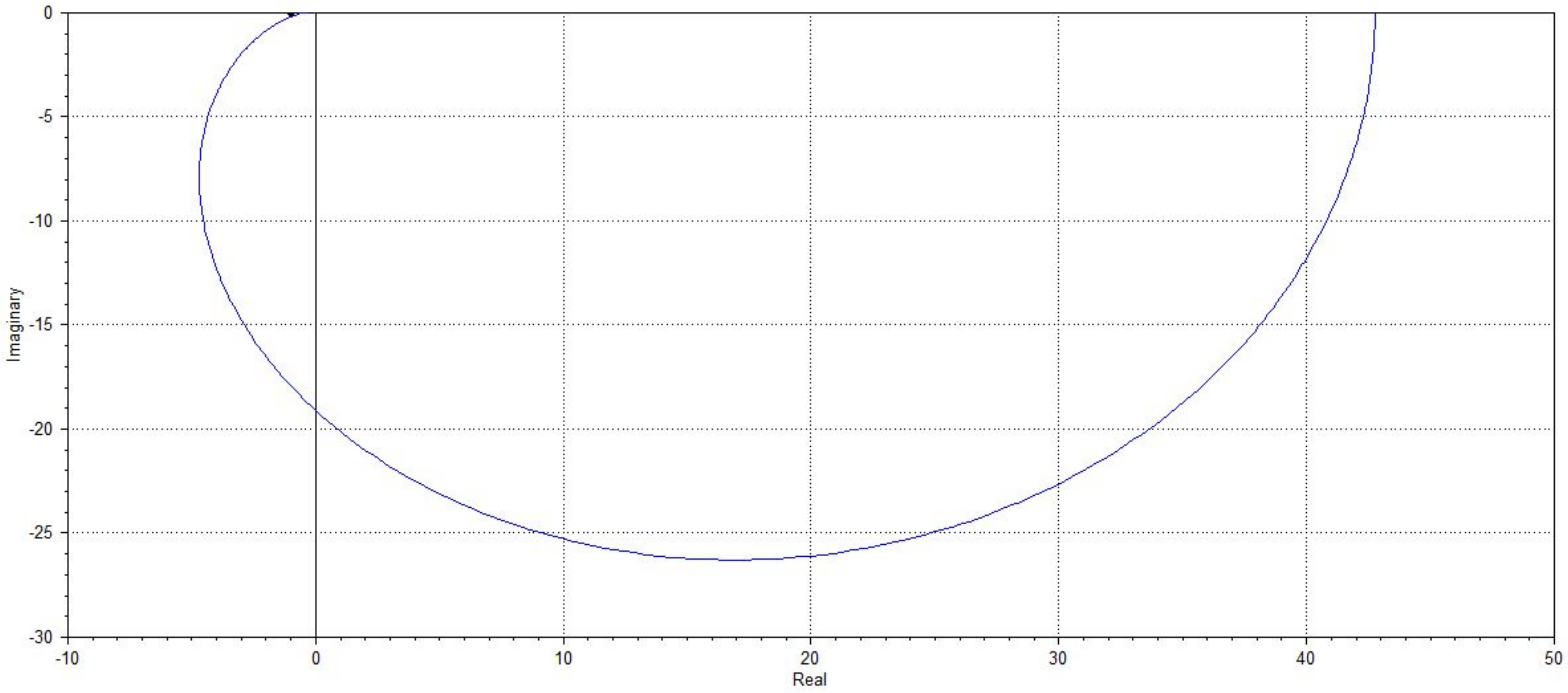


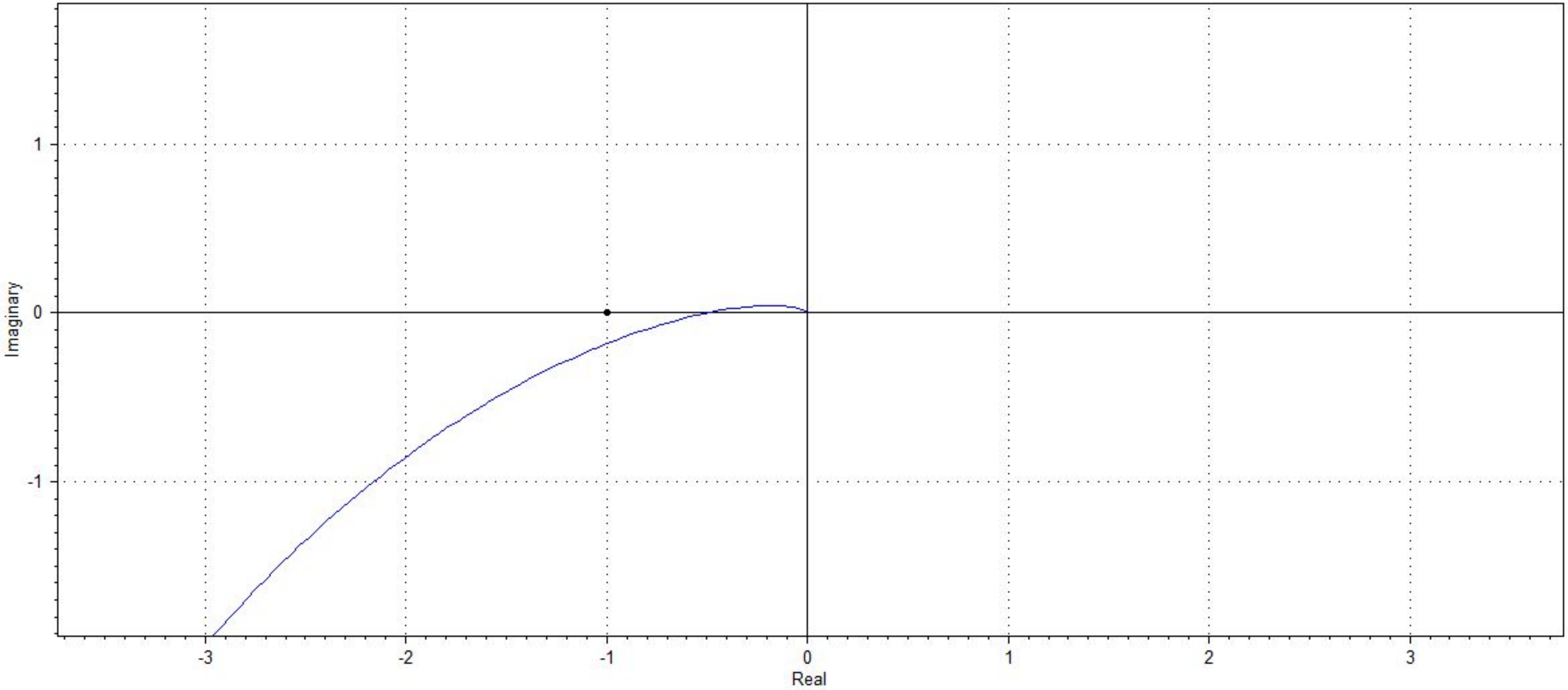
40
20
0
-20
-40
-60
-80
-100
-120
-140
-160
Magnitude dB
0
-45
-90
-135
-180
-225
-270
-315
-360
-405
-450
Phase (degrees)
10^{-3}
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
10^{3}
Freq (rad/sec)



40
20
0
-20
-40
-60
-80
-100
-120
-140
-160
Magnitude dB
0
-45
-90
-135
-180
-225
-270
-315
-360
-405
-450
Phase (degrees)
10^{-3}
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
10^{3}
Freq (rad/sec)

Nyquist Go*Gp





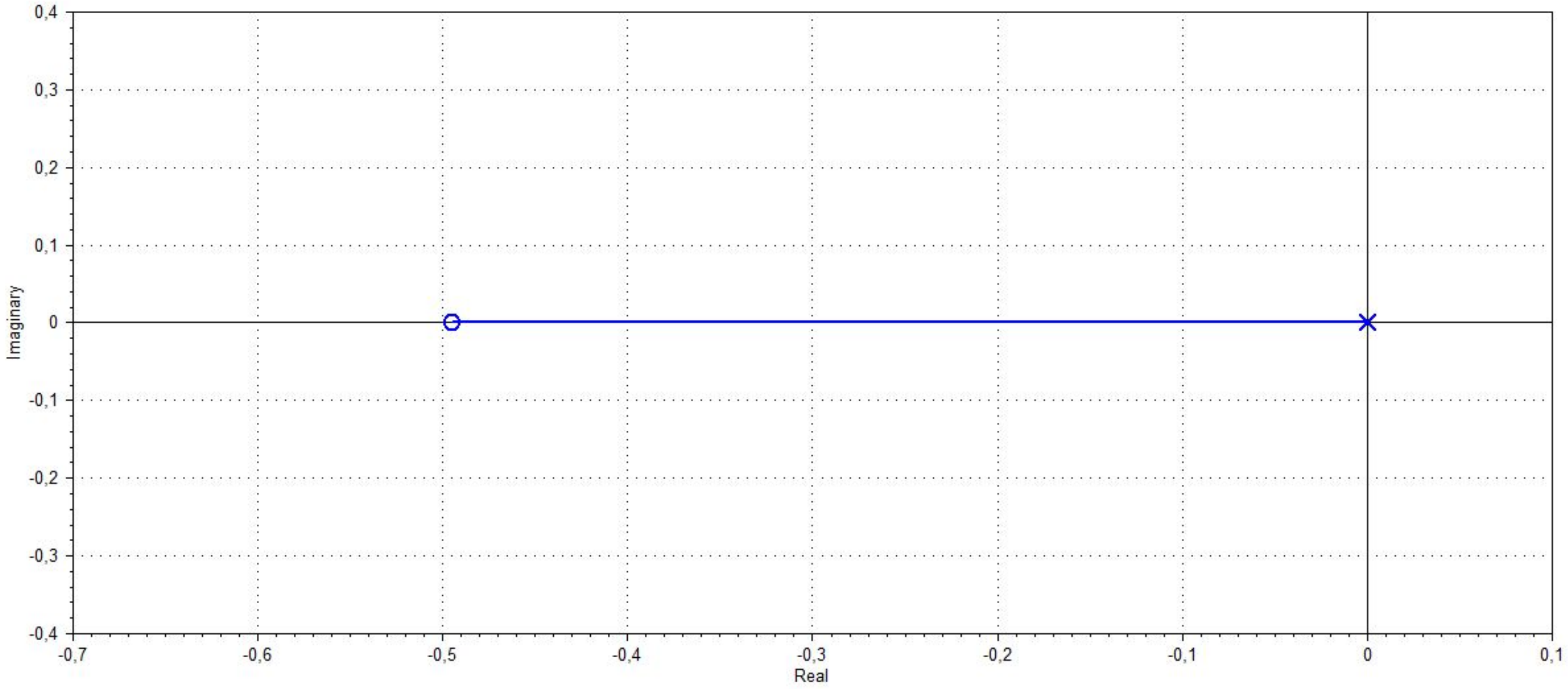
1
0
-1
Imaginary
-3
-2
-1
0
1
2
3
Real

Raices	⅙ ,½ y 10
Ku	21,35/10.69 ≈ 2
wu	3/2 * (3)^½

Gpi

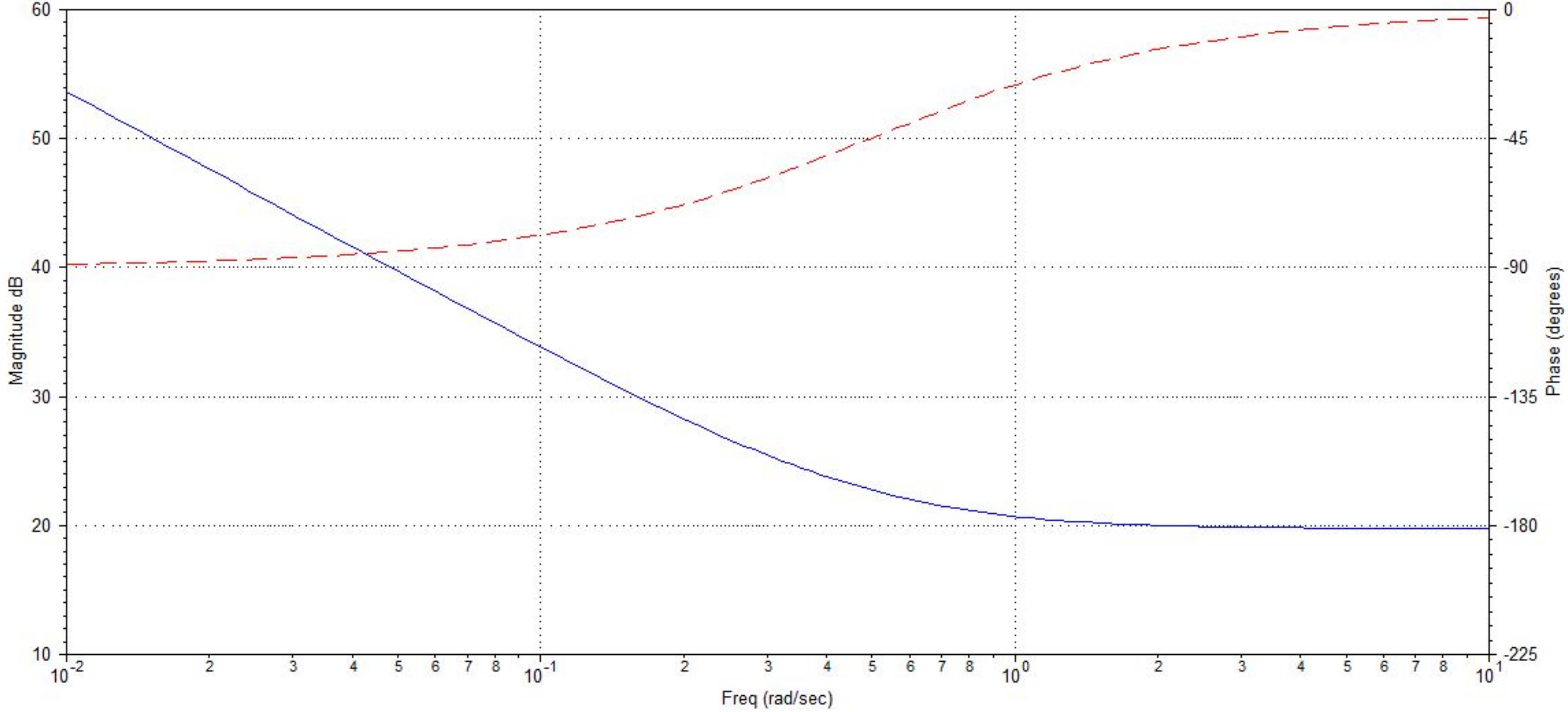
$$9.72 \times \frac{s + 0.495}{s}$$

Raices Gpi



Agrega un polo en 0 y una raiz en -0,495

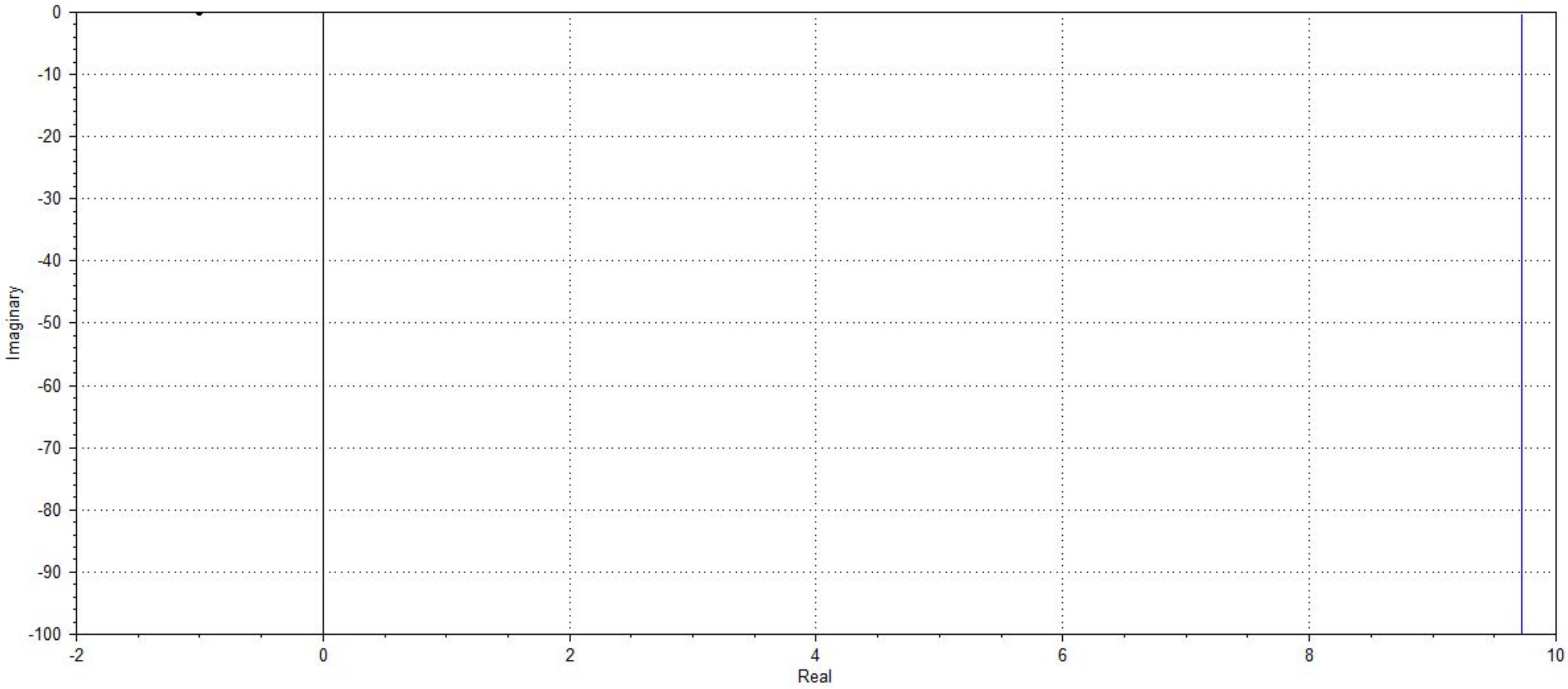
Bode Gpi



60
50
40
30
20
10
Magnitude dB
0
-45
-90
-135
-180
-225
Phase (degrees)
10^{-2}
2
3
4
5
6
7
8
10^{-1}
10^{0}
10^{1}
Freq (rad/sec)

A bajas frecuencias predomina el efecto integral y se observa en un retardo capacitivo en la fase. A medida que incrementa la frecuencia aumenta el efecto proporcional, disminuye el integral y la fase tiende a 0.

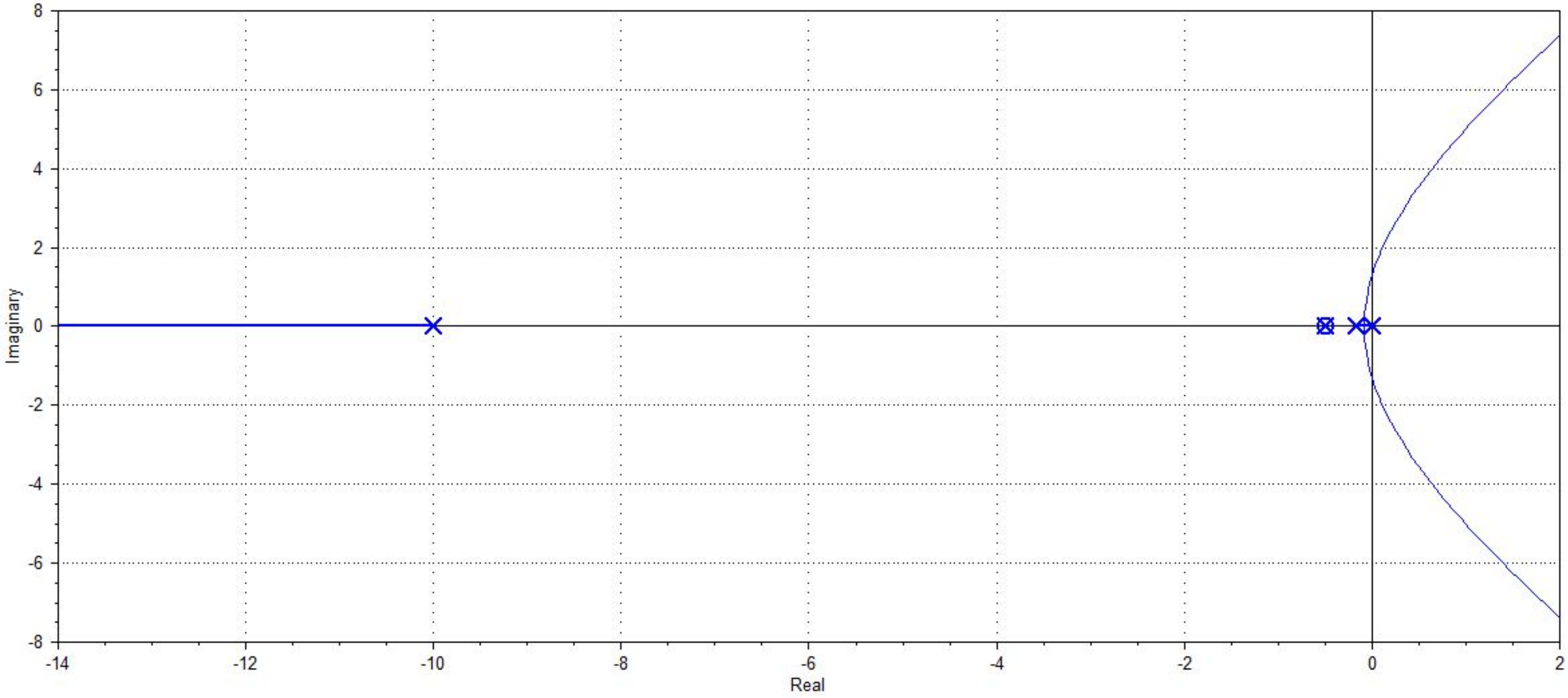
Nyquist Gpi

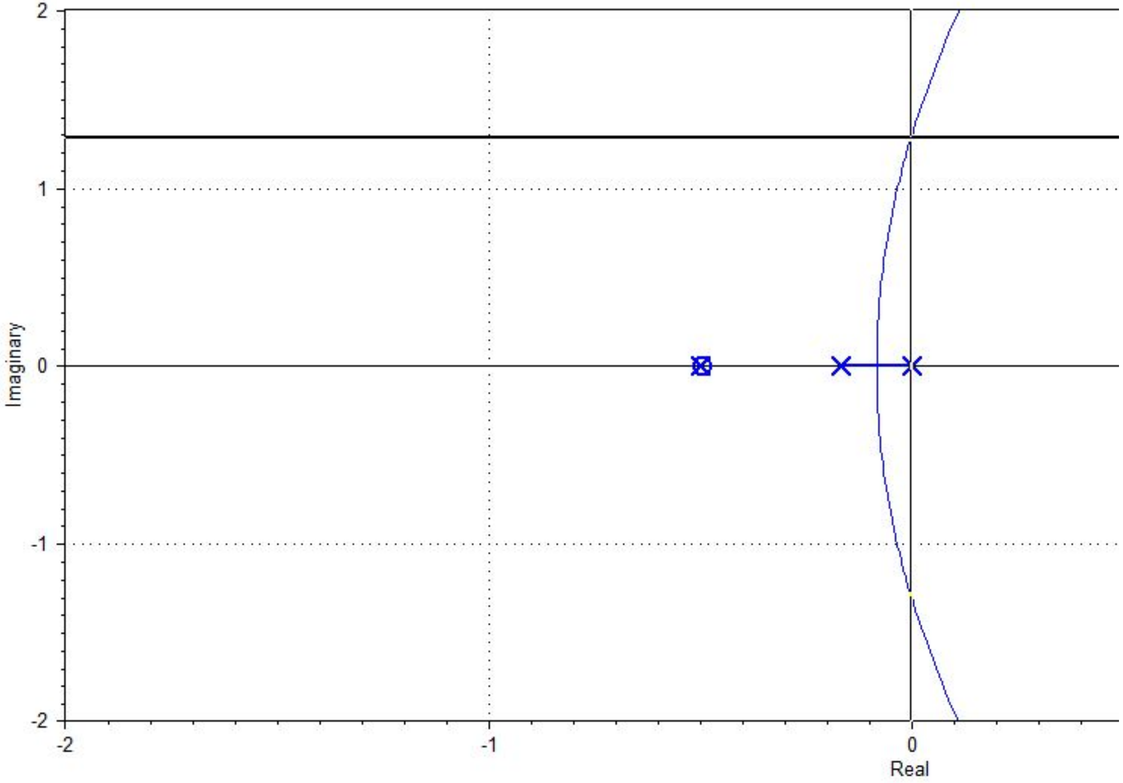


Es una recta en 9,72 en los reales y todos los valores de i desde -inf hasta 0

Go*Gpi

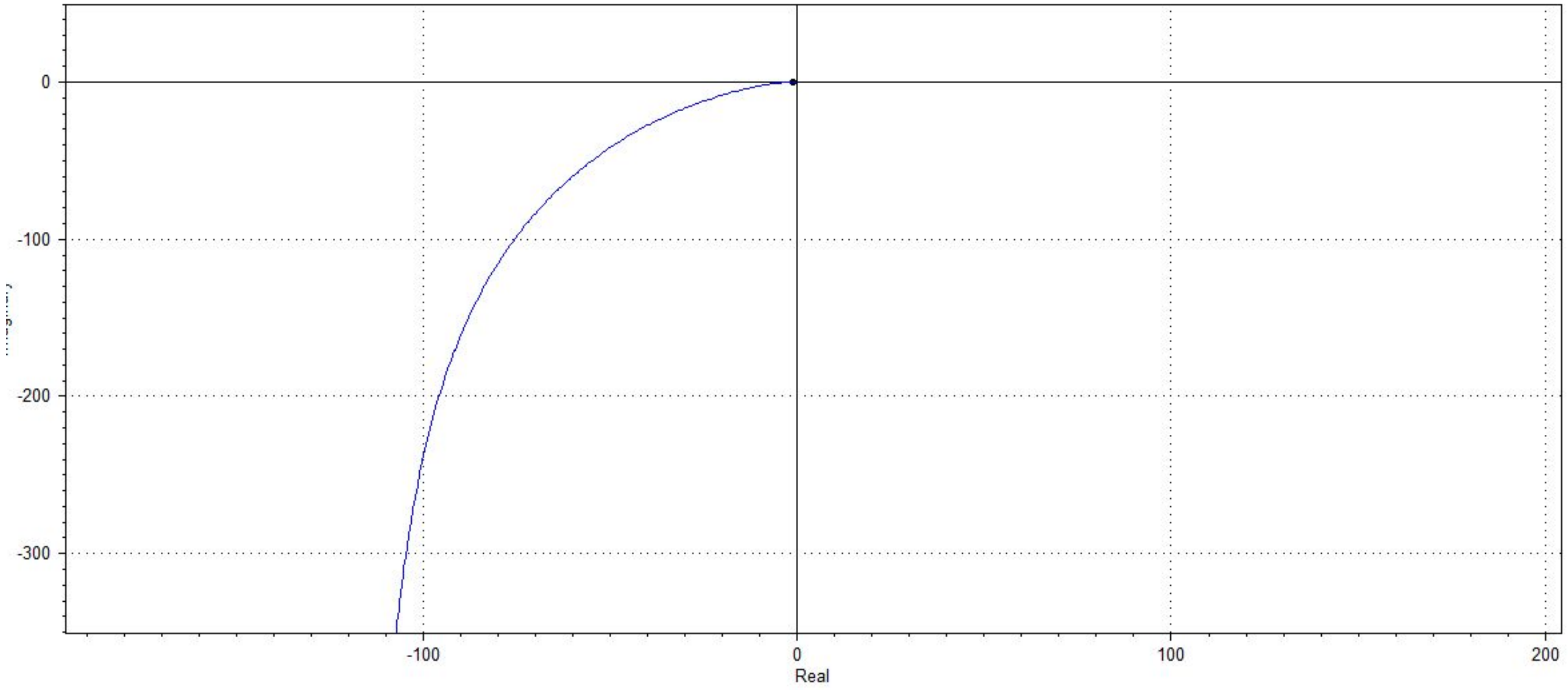
Raices Go*Gpi



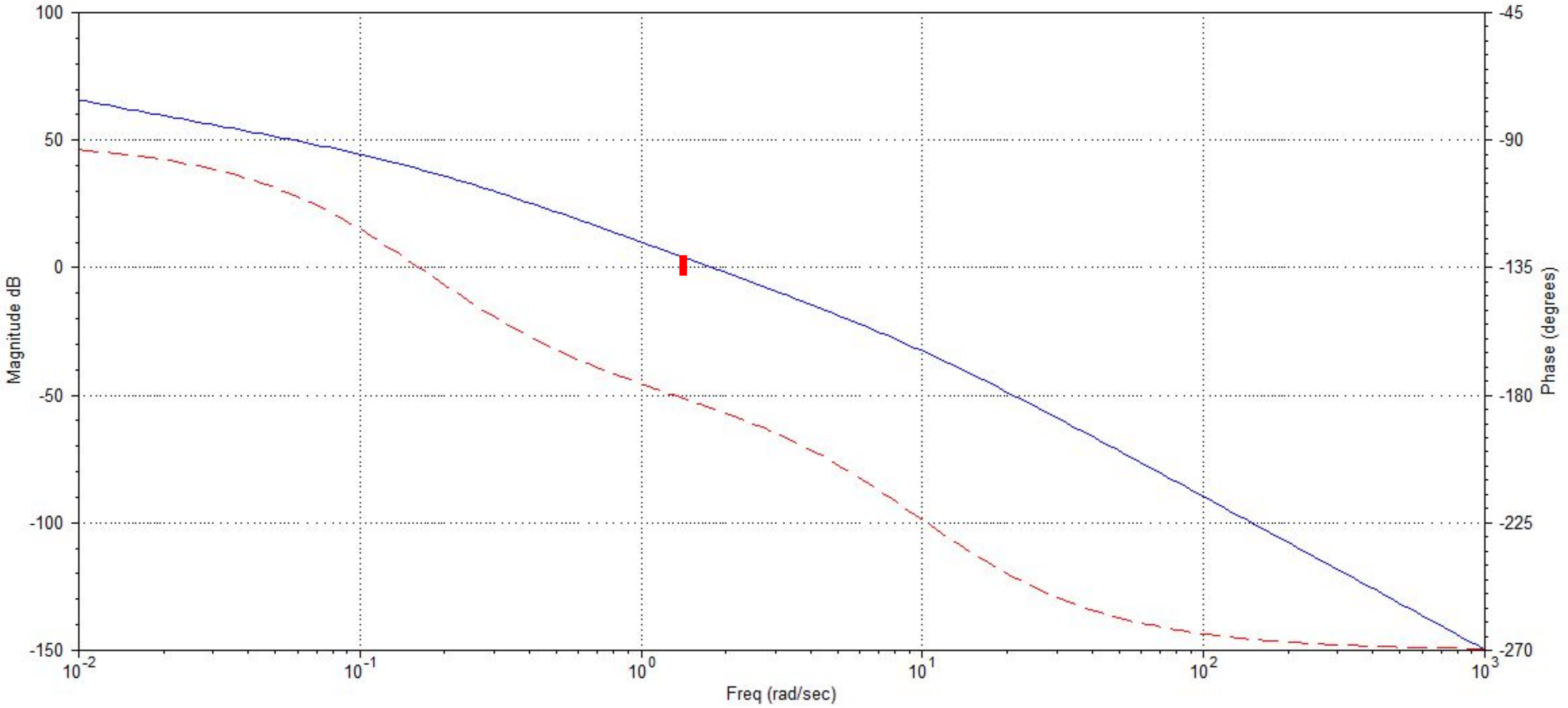


s= 0 +1,287j (Mag= 1,287, Zeta= -0)
gain= 0,5201 -0,002189j (Mag= 0,5201, Phase= -0,2411 deg)

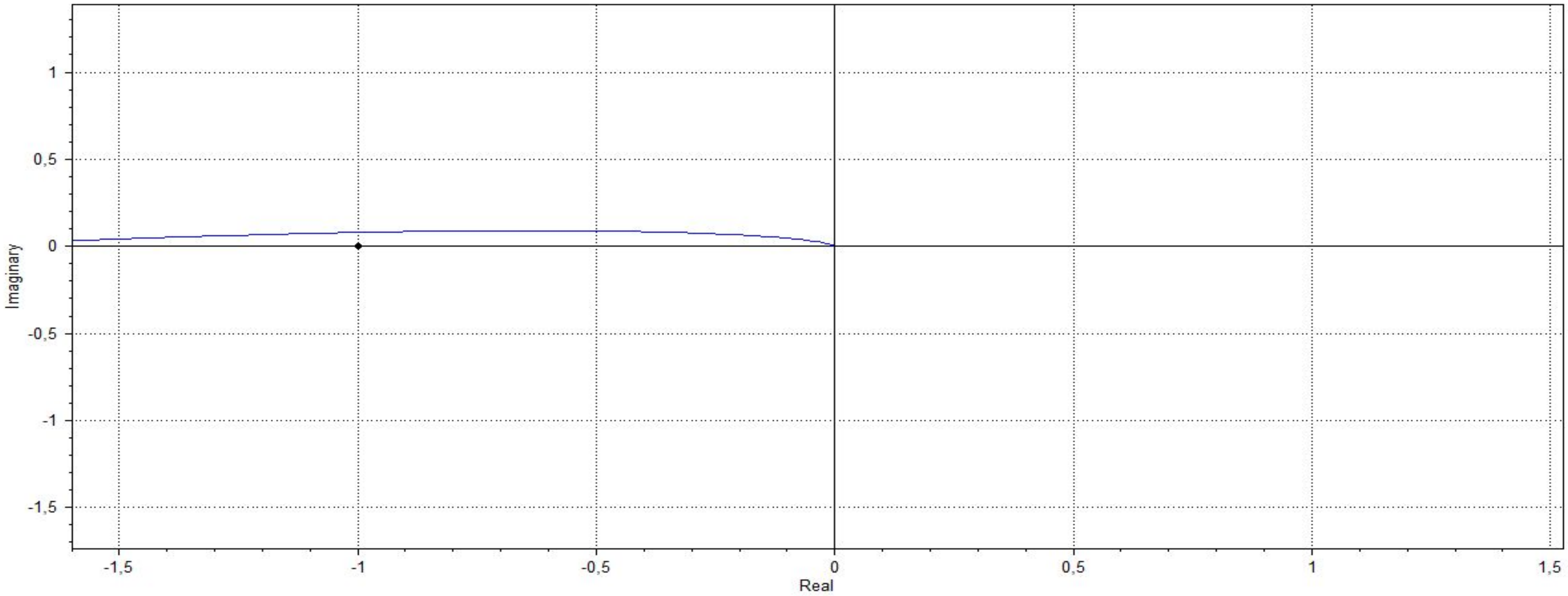
Nyquist Go*Gpi



Bode Go*Gpi



100
50
0
-50
-100
-150
Magnitude dB
-45
-90
-135
-180
-225
-270
Phase (degrees)
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
10^{3}
Freq (rad/sec)



1
0,5
0
-0,5
-1
-1,5
Imaginary
-1,5
-1
-0,5
0
0,5
1
1,5
Real

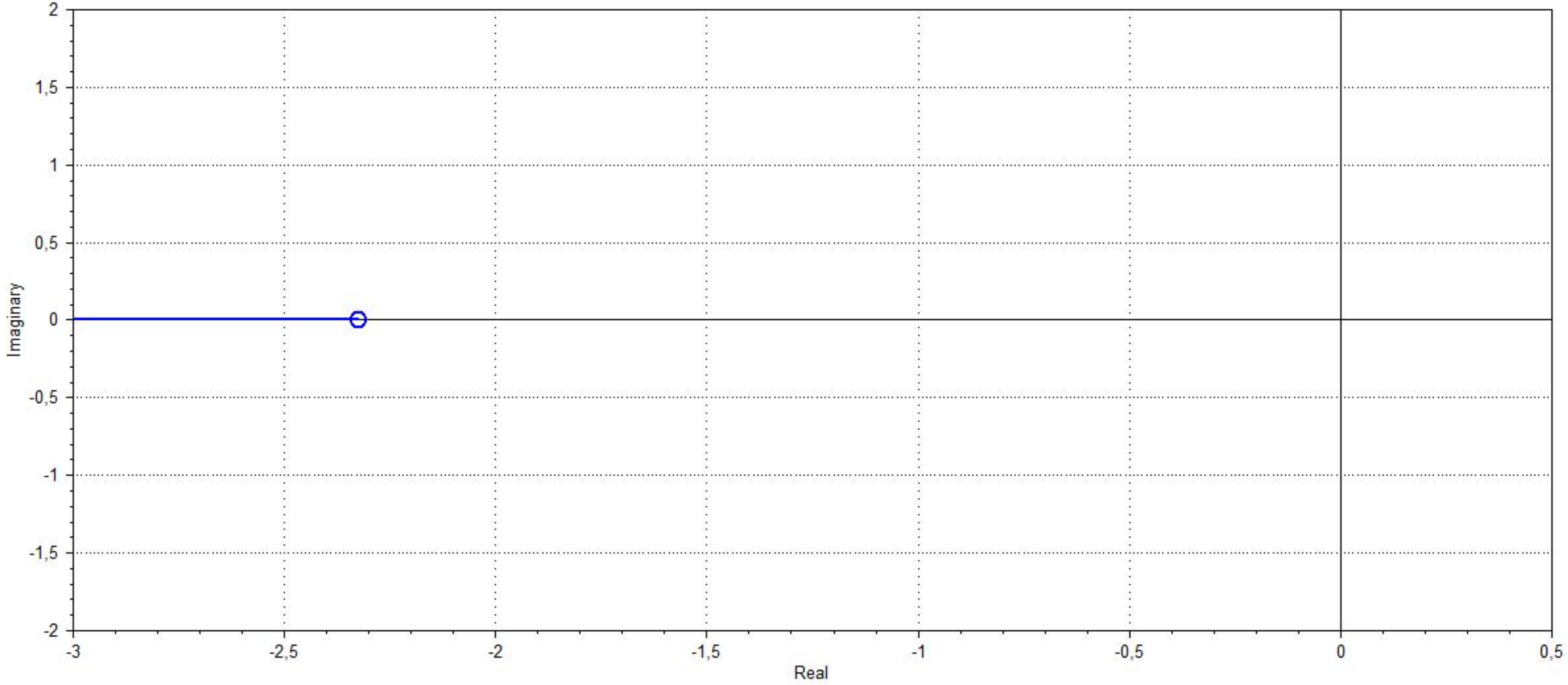
En Gpi*G0,

Raices	0, ½ , ⅙ y 10
Ku	0,5 aprox
wu	1,28 aprox

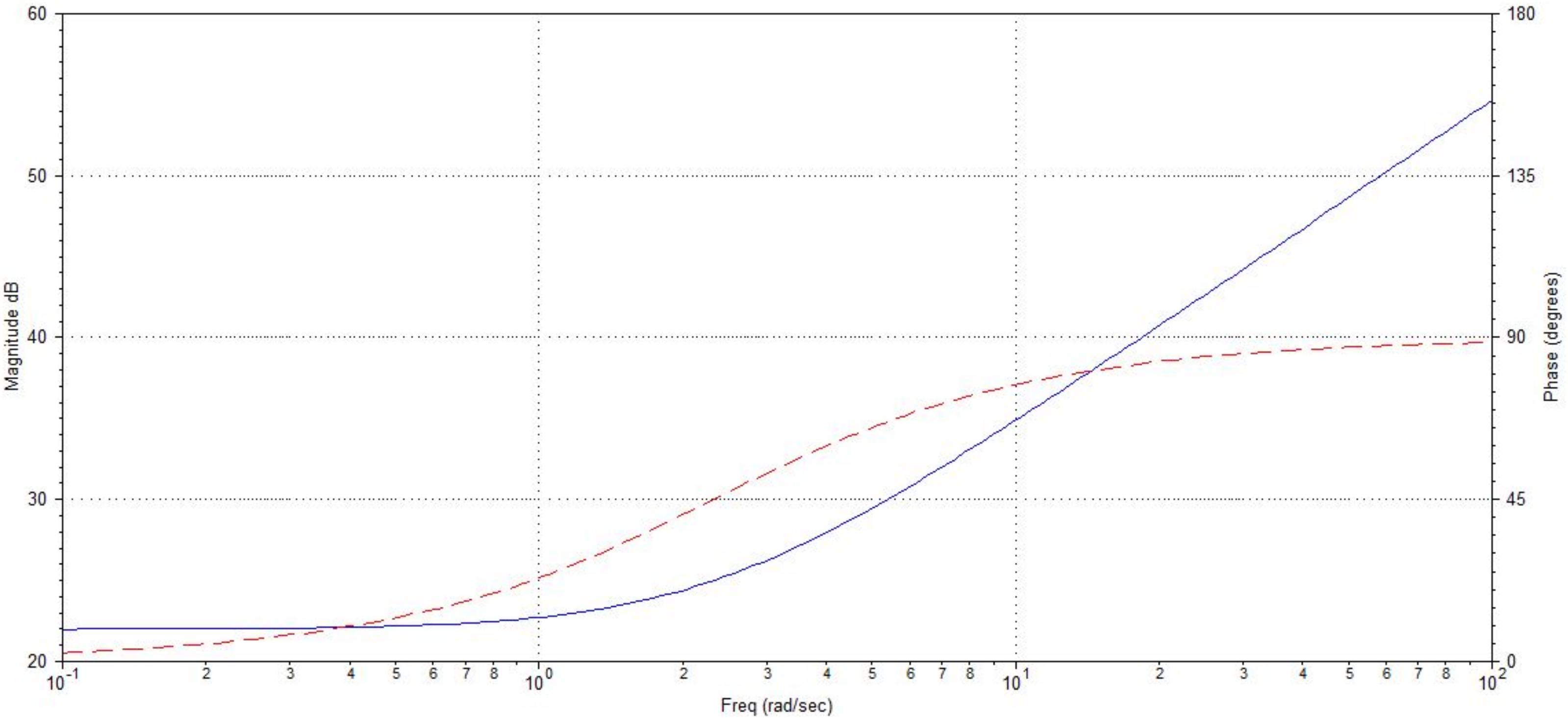
Gd

$$12.57 \times (1 + 0.34s)$$

Raíces de Gd (no agrega polos pero si un cero)



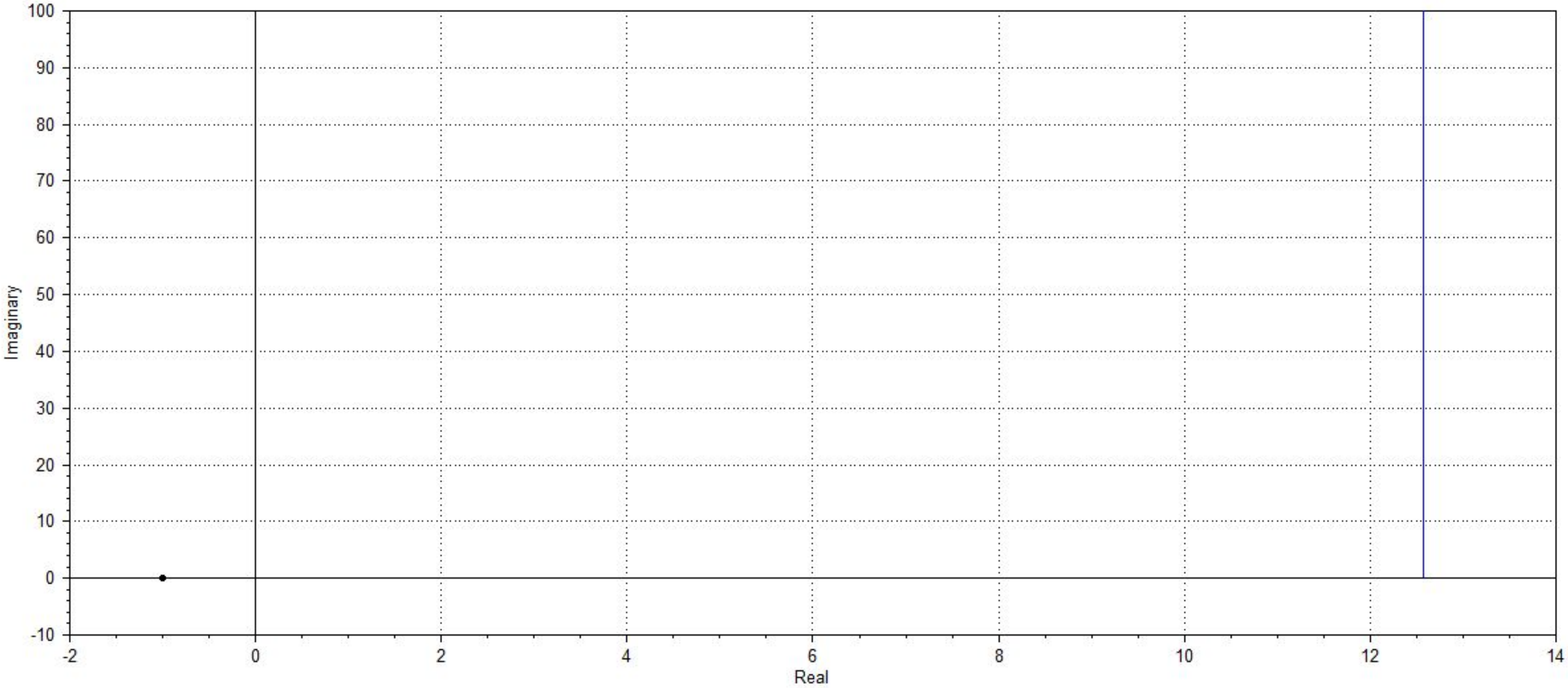
Bode Gd



60
50
40
30
20
180
135
90
45
0
Magnitude dB
Phase (degrees)
Freq (rad/sec)

En bajas frecuencias predomina la parte proporcional sobre la derivativa. A medida que aumenta la frecuencia, la derivativa toma importancia. En el aumento de la fase se ve como anula los retardos capacitivos

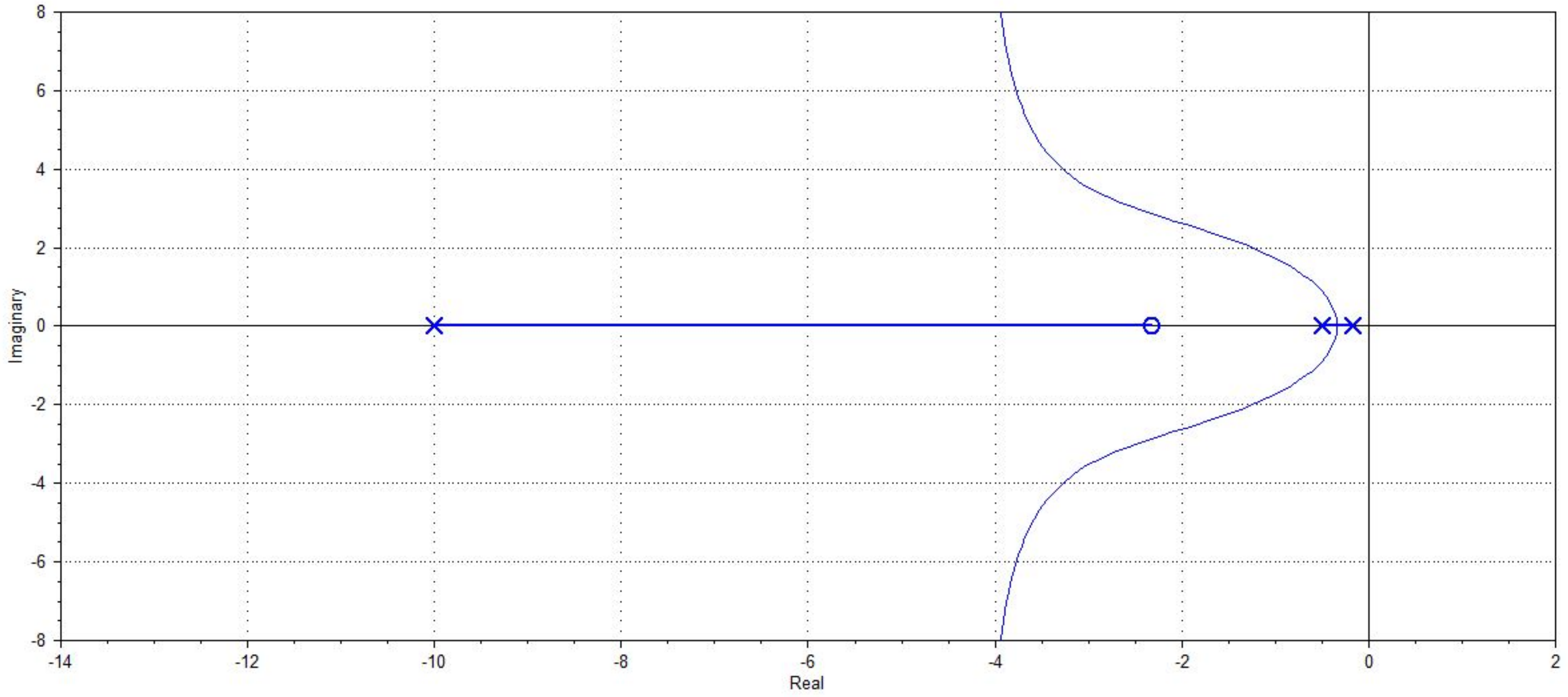
Nyquist Gd



Posee una recta en 12.57 de los reales que se extiende de 0 a inf en los imaginarios

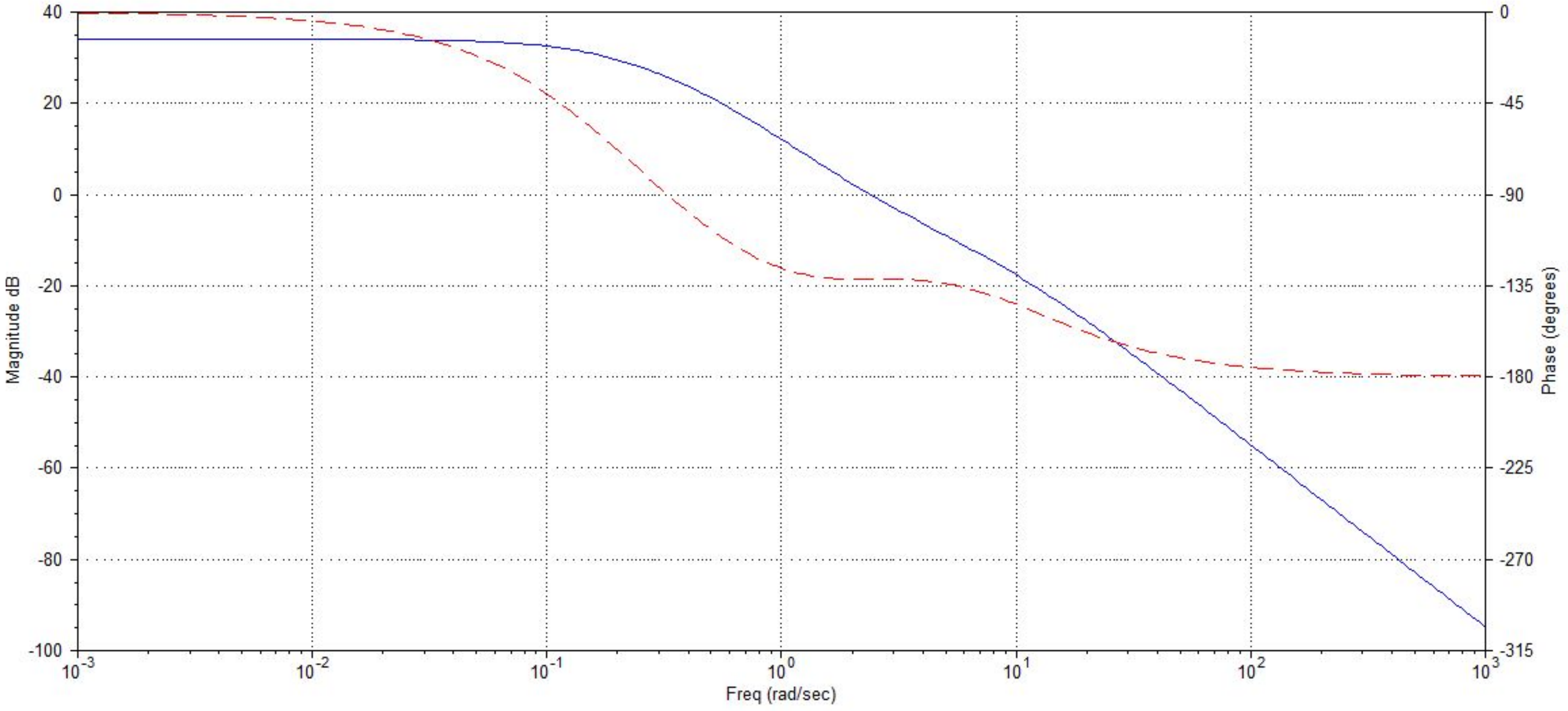
Go*Gd

Raices Go*Gd



No hay un valor de K que sea el ultimo

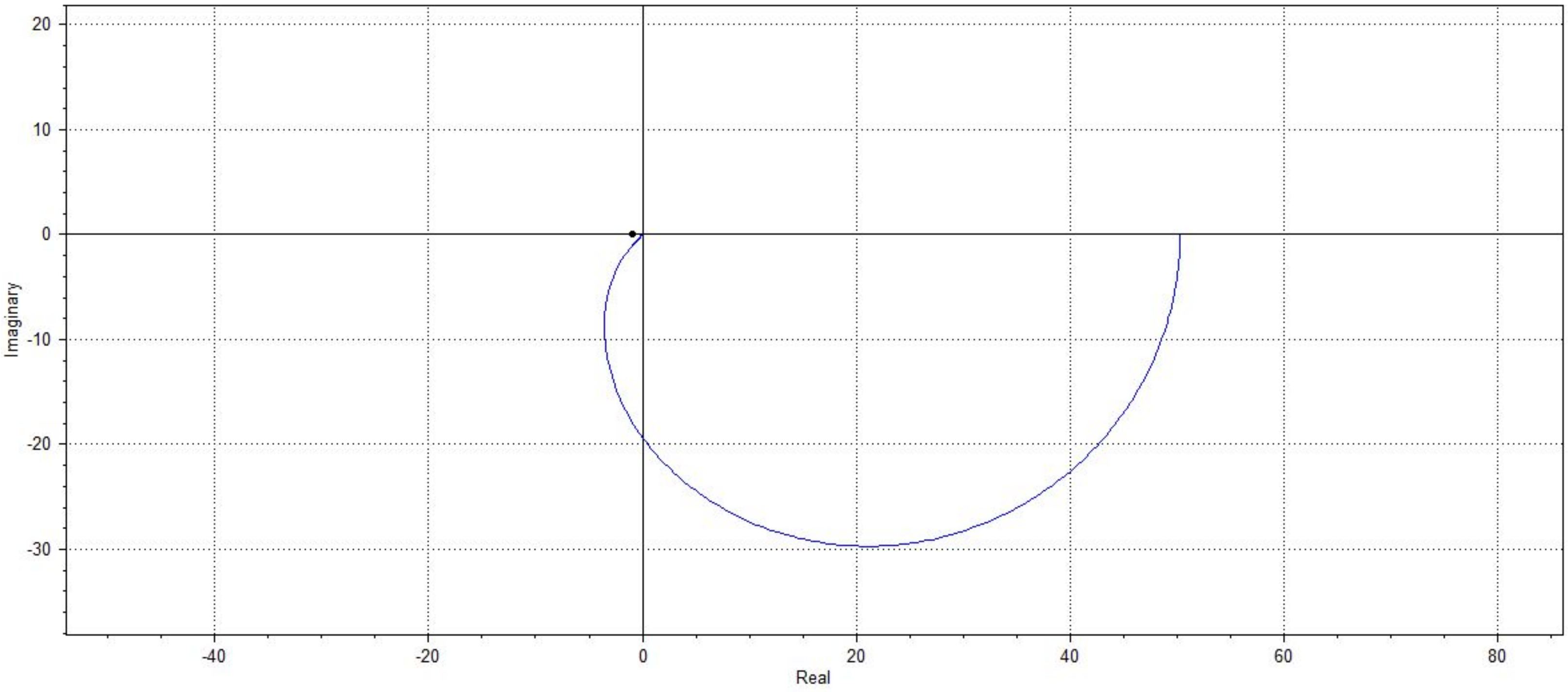
Bode Go*Gd

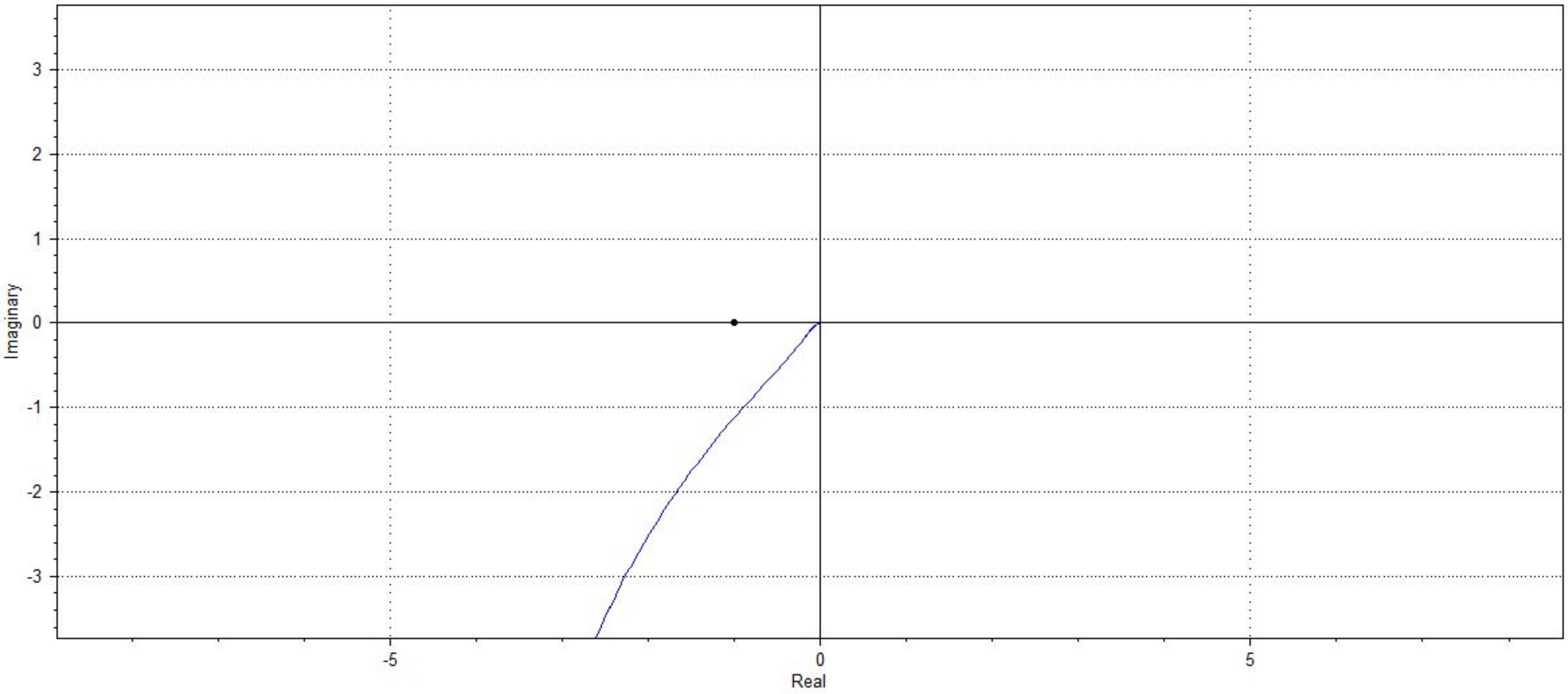


40
20
0
-20
-40
-60
-80
-100
Magnitude dB
0
-45
-90
-135
-180
-225
-270
-315
Phase (degrees)
10^{-3}
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
10^{3}
Freq (rad/sec)

Es infinitamente estable, ya que en frecuencia infinita la fase tiende a 180

Nyquist G0*Gd



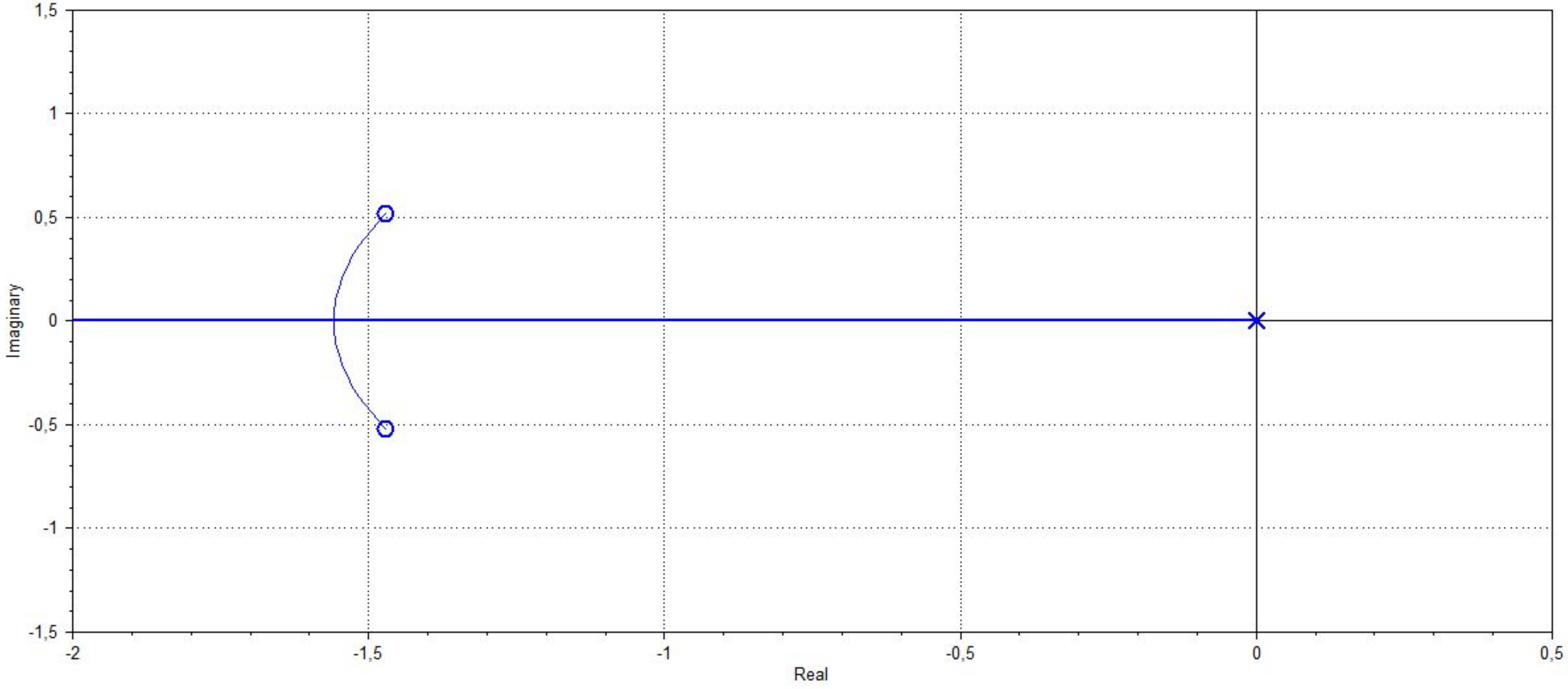


3
2
1
0
-1
-2
-3
Imaginary
-5
0
5
Real

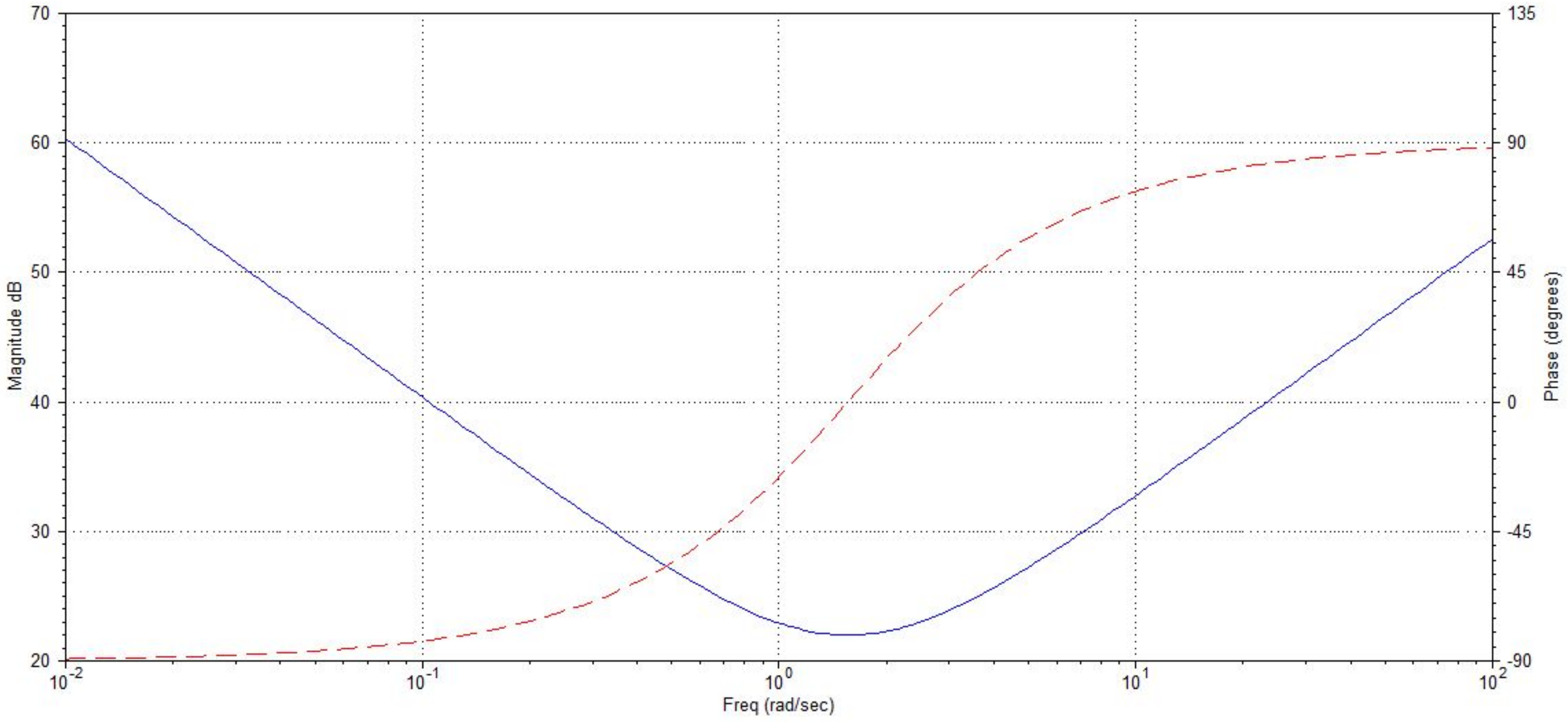
Raices	$\frac{1}{2}$,$\frac{1}{6}$ y 10 (agrega un cero que “anula” una raiz)
Ku	no tiene (creo)
wu	no tiene (creo)

Gpid

Raices Gpid

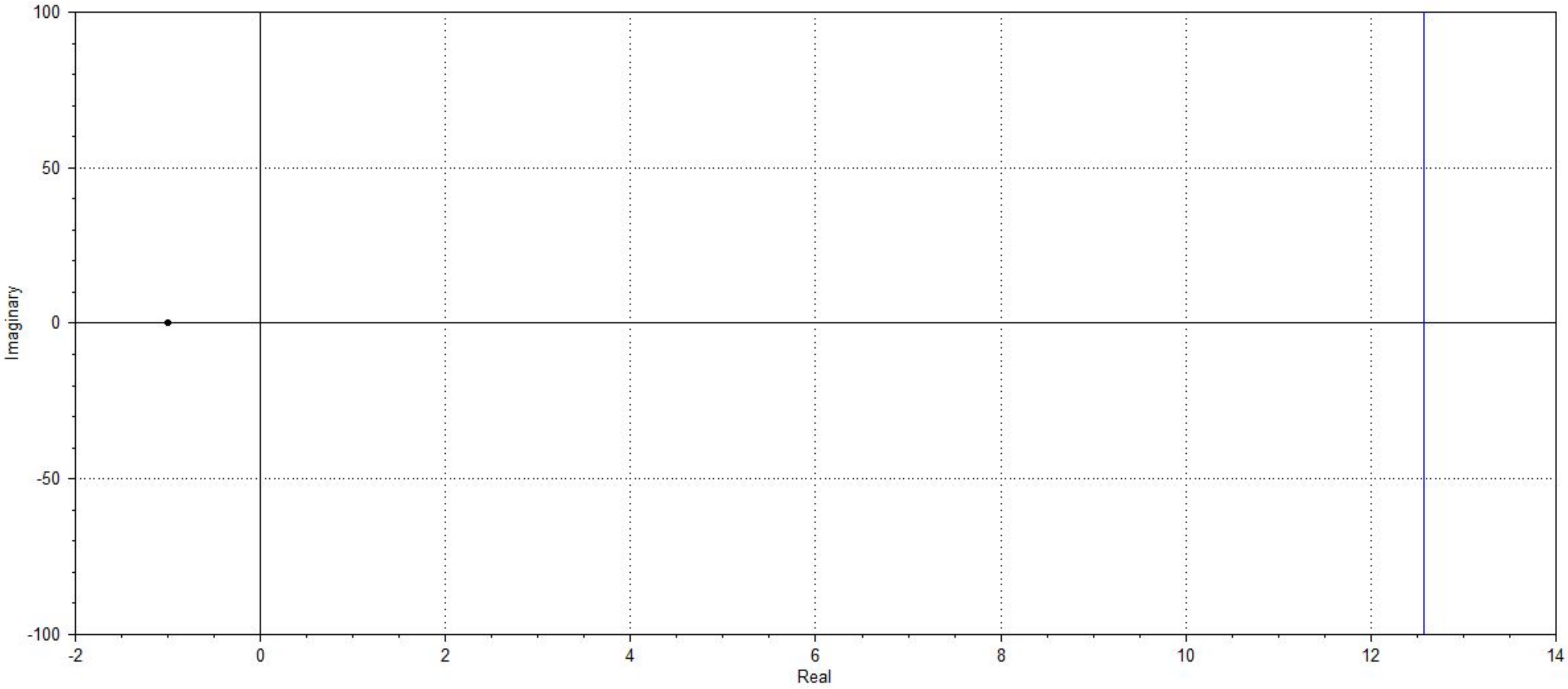


Bode Gpid



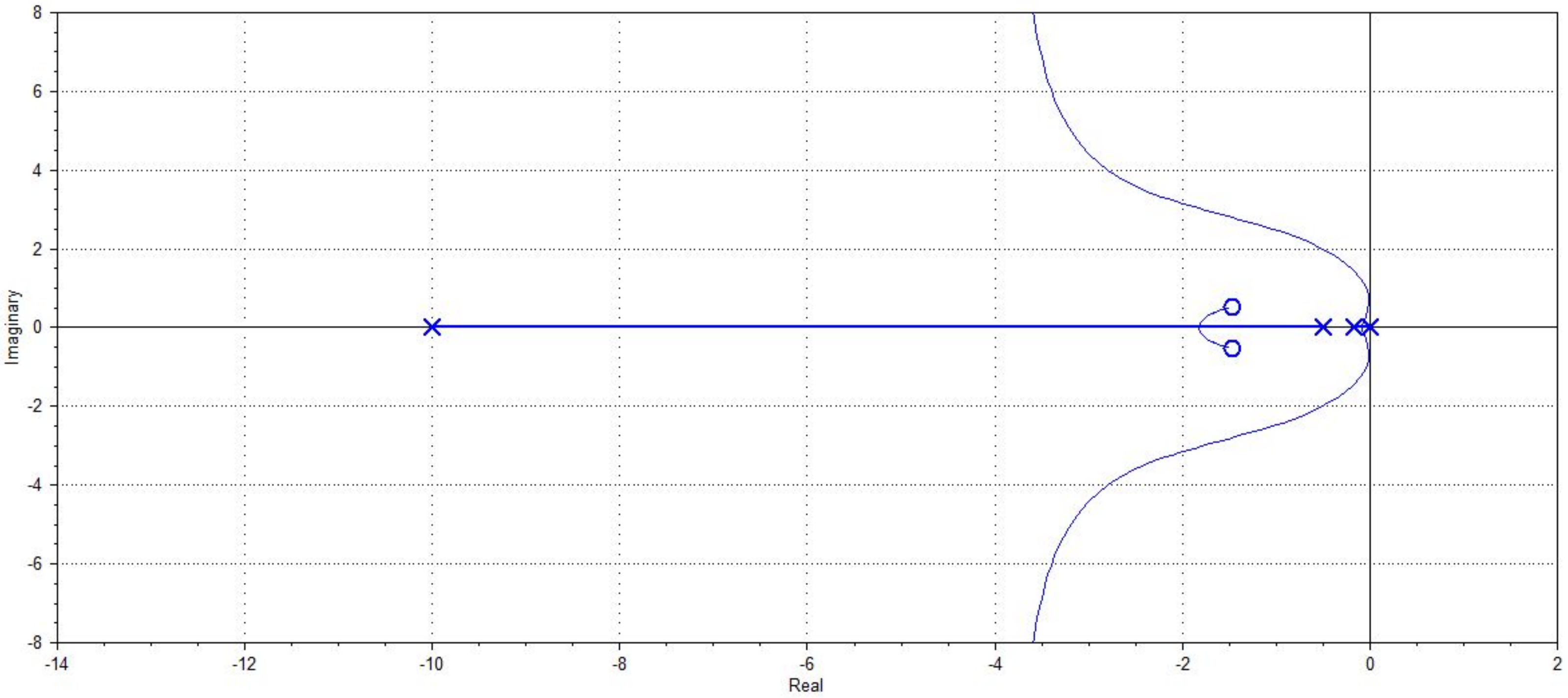
70
60
50
40
30
20
Magnitude dB
135
90
45
0
-45
-90
Phase (degrees)
10^{-2}
10^{-1}
10^{0}
10^{1}
10^{2}
Freq (rad/sec)

Nyquist Gpid

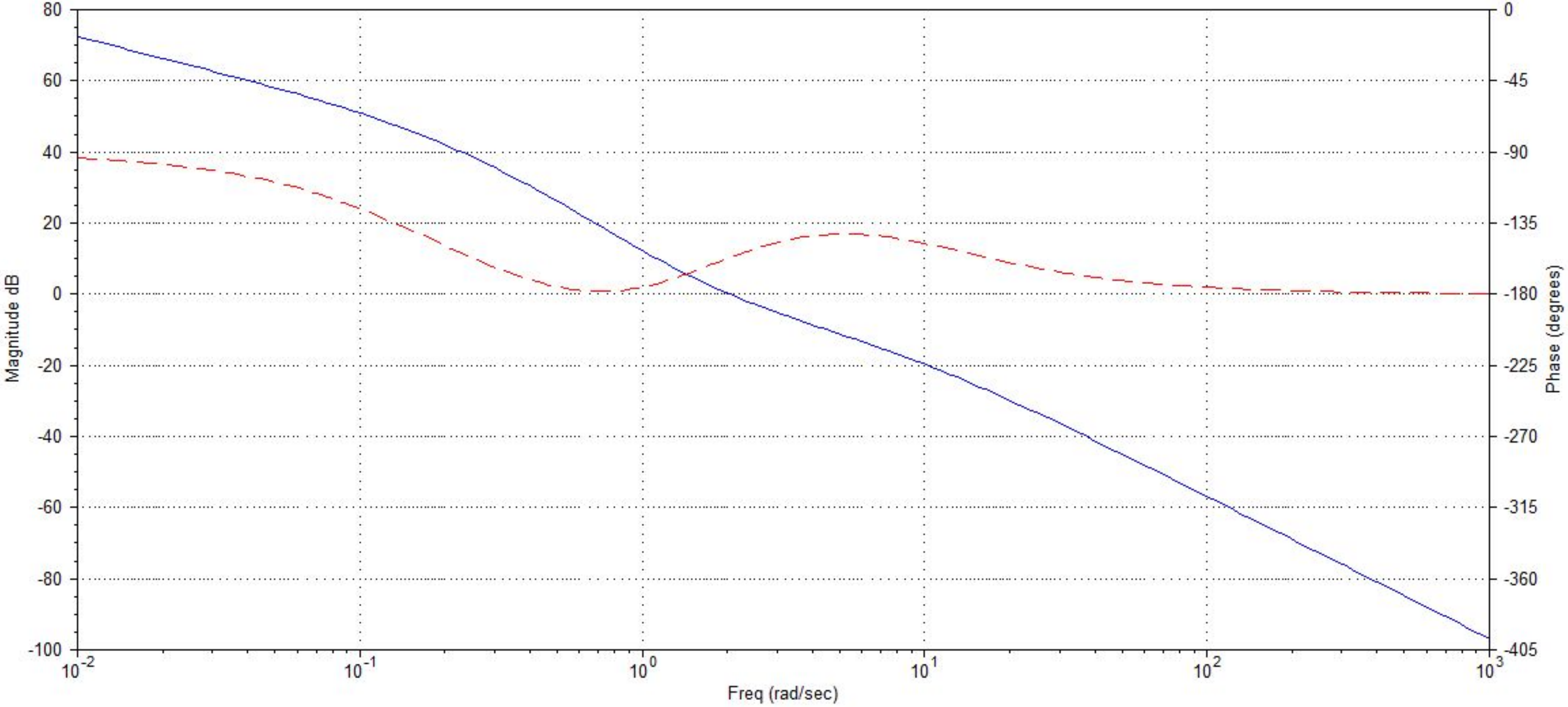


Go*Gpid

Raices Go*Gpid

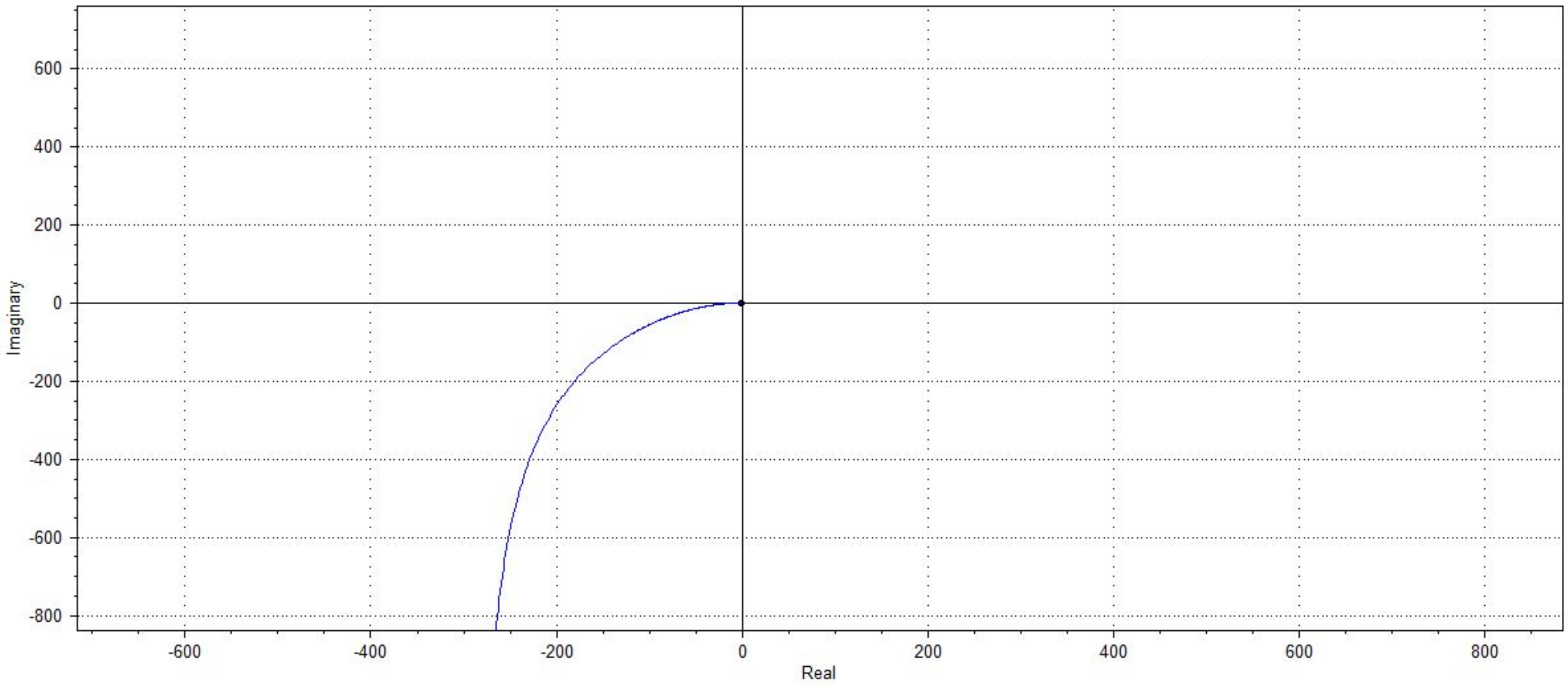


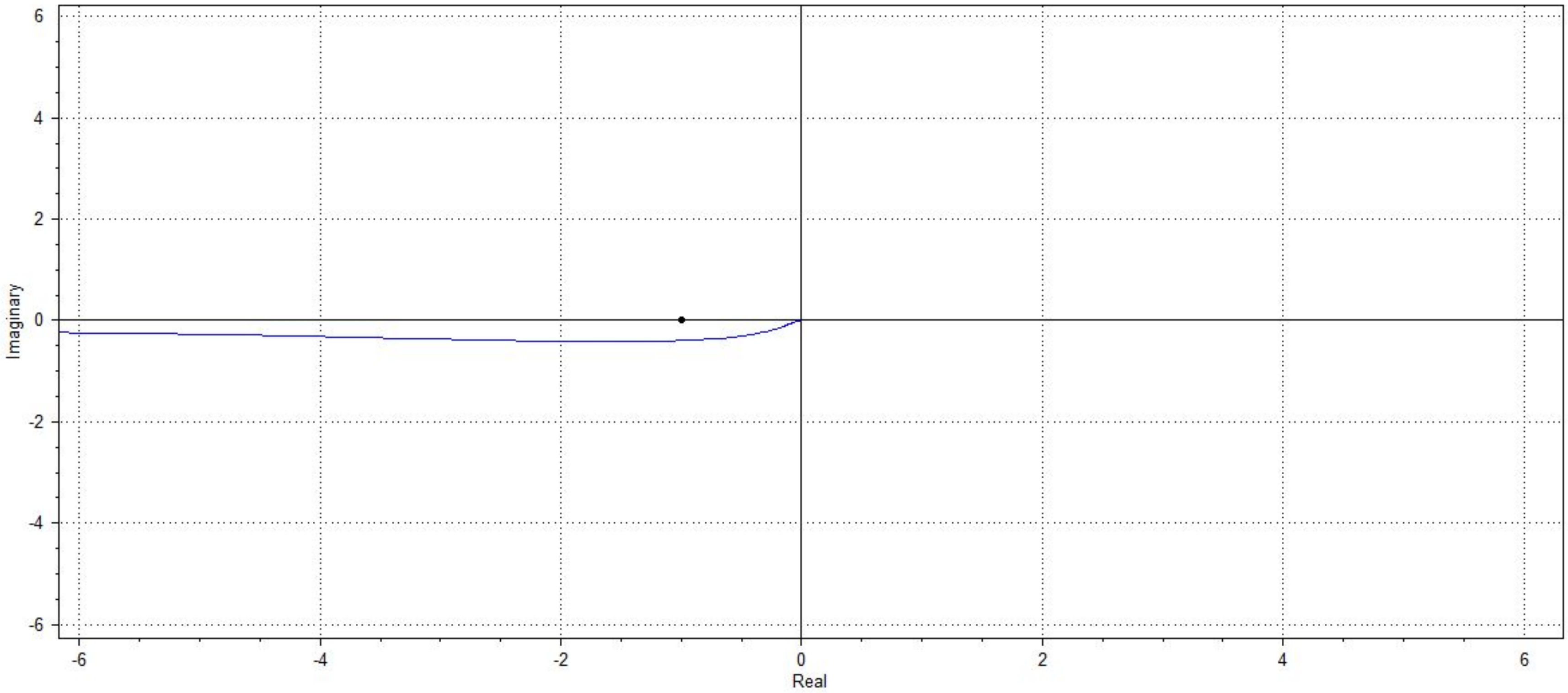
Bode Go*Gpid



80
60
40
20
0
-20
-40
-60
-80
-100
Magnitude dB
0
-45
-90
-135
-180
-225
-270
-315
-360
-405
Phase (degrees)
10^-2
10^-1
10^0
10^1
10^2
10^3
Freq (rad/sec)

Nyquist Go*Gpid

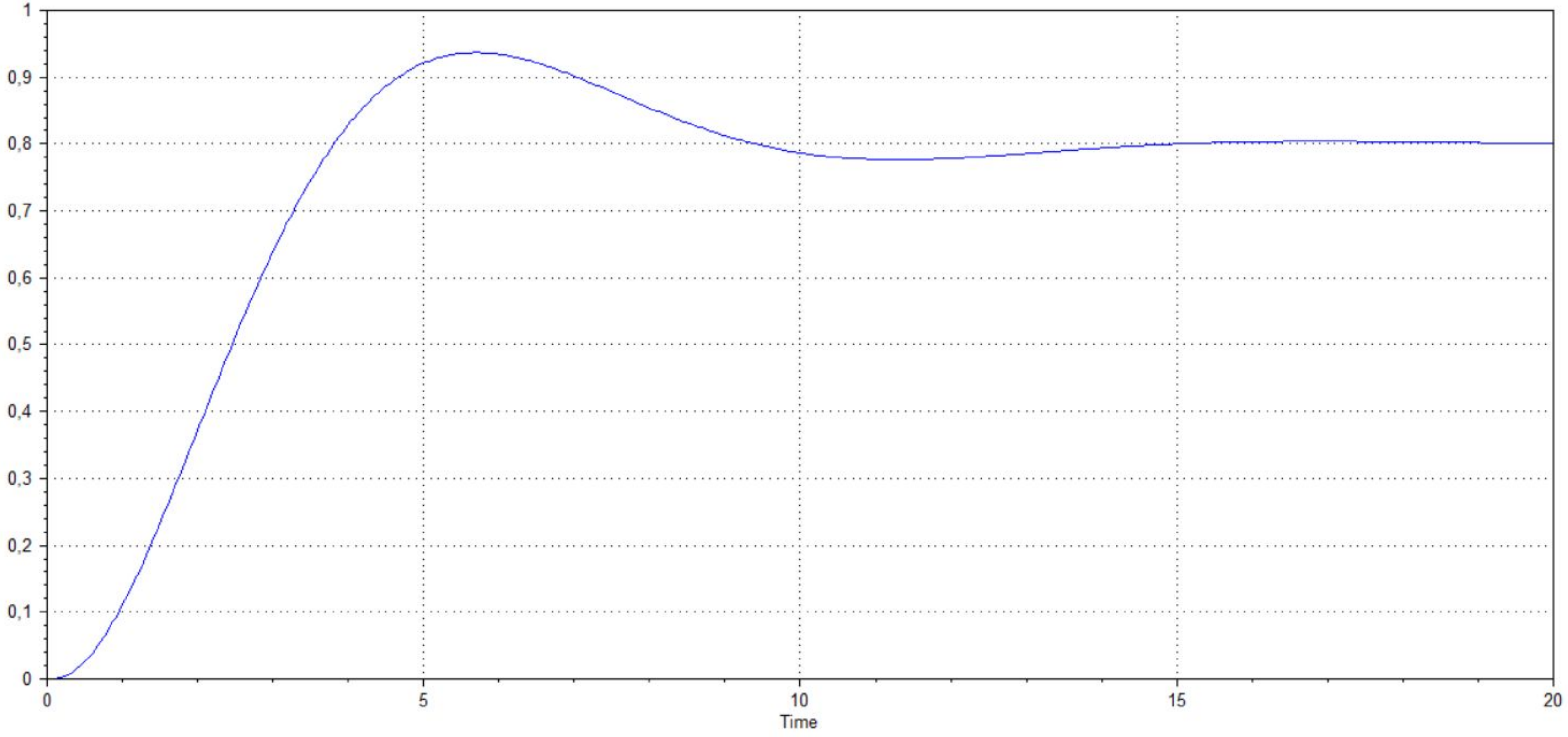




6
4
2
0
-2
-4
-6
Imaginary
-6
-4
-2
0
2
4
6
Real

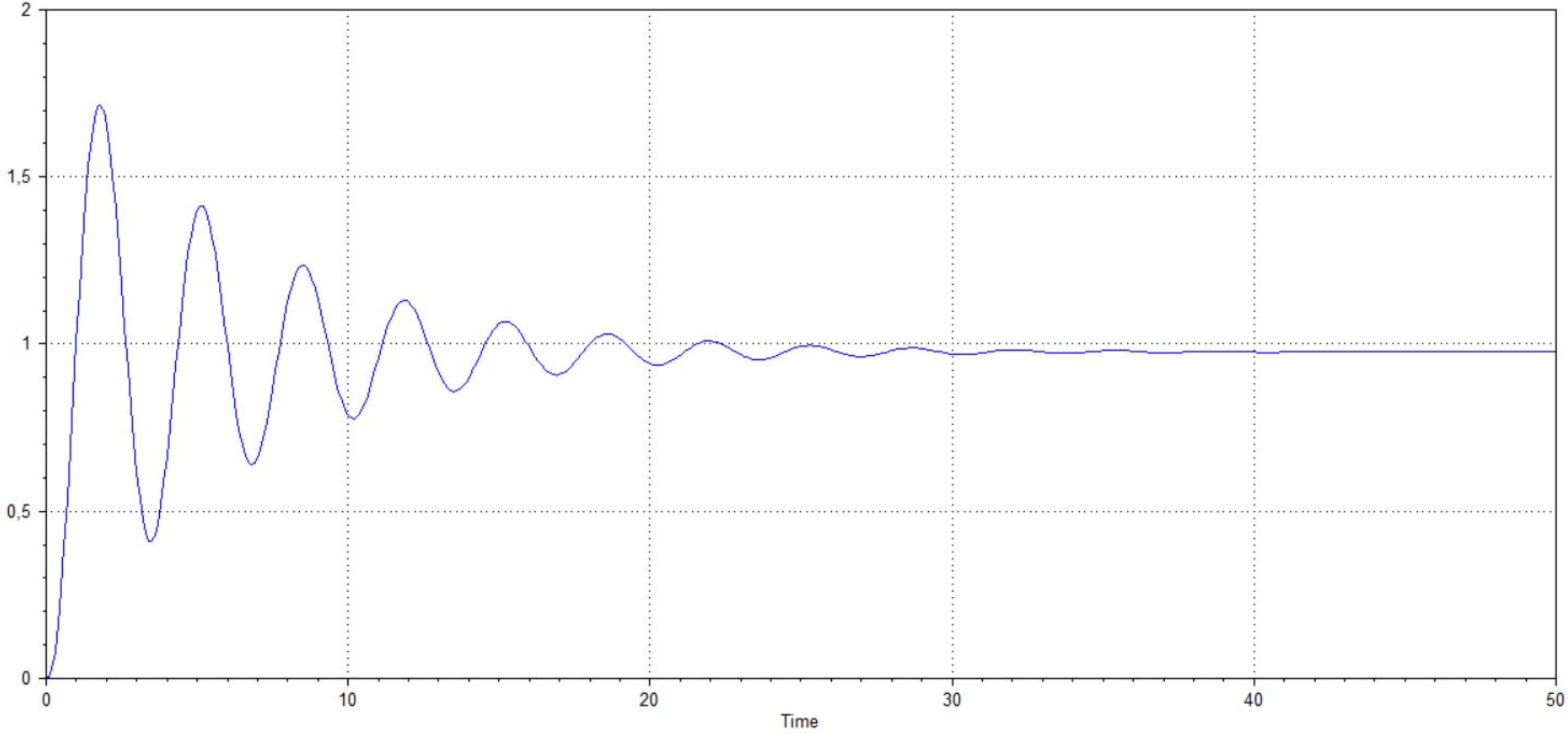
EJERCICIO 5

G0


1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
0
5
10
15
20
Time

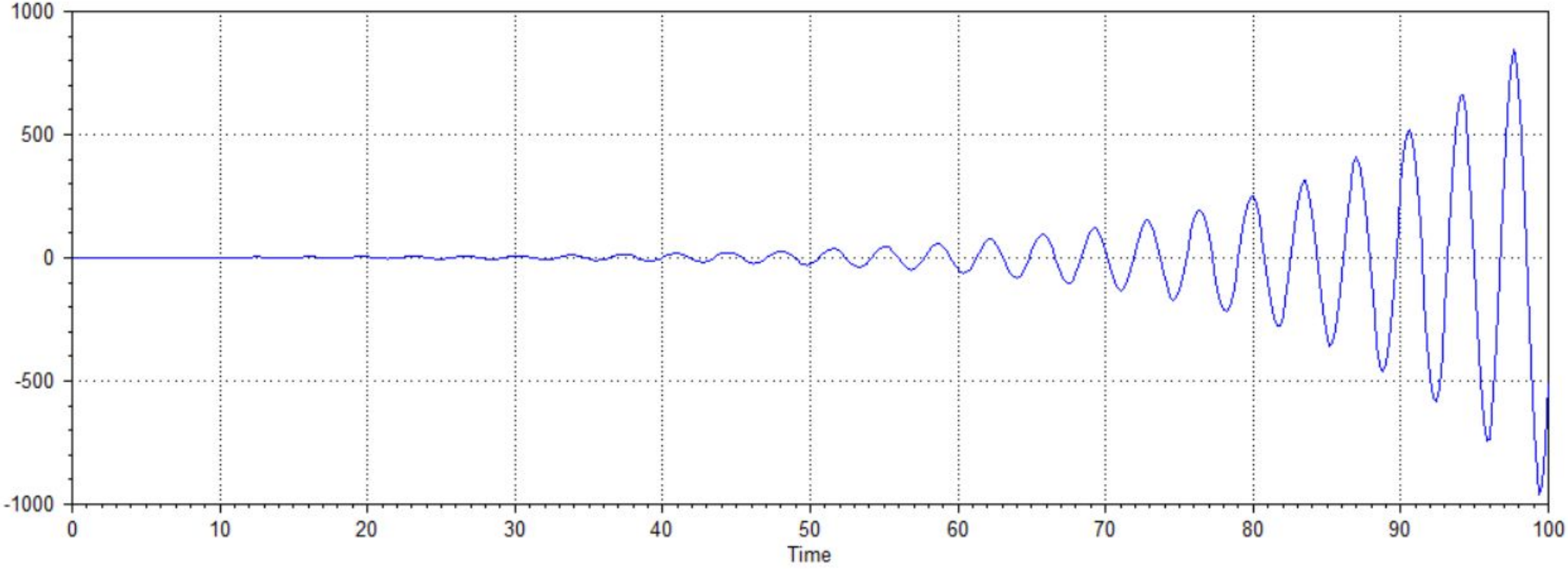
P

G0 * Gp


2
1,5
1
0,5
0
0
10
20
30
40
50
Time

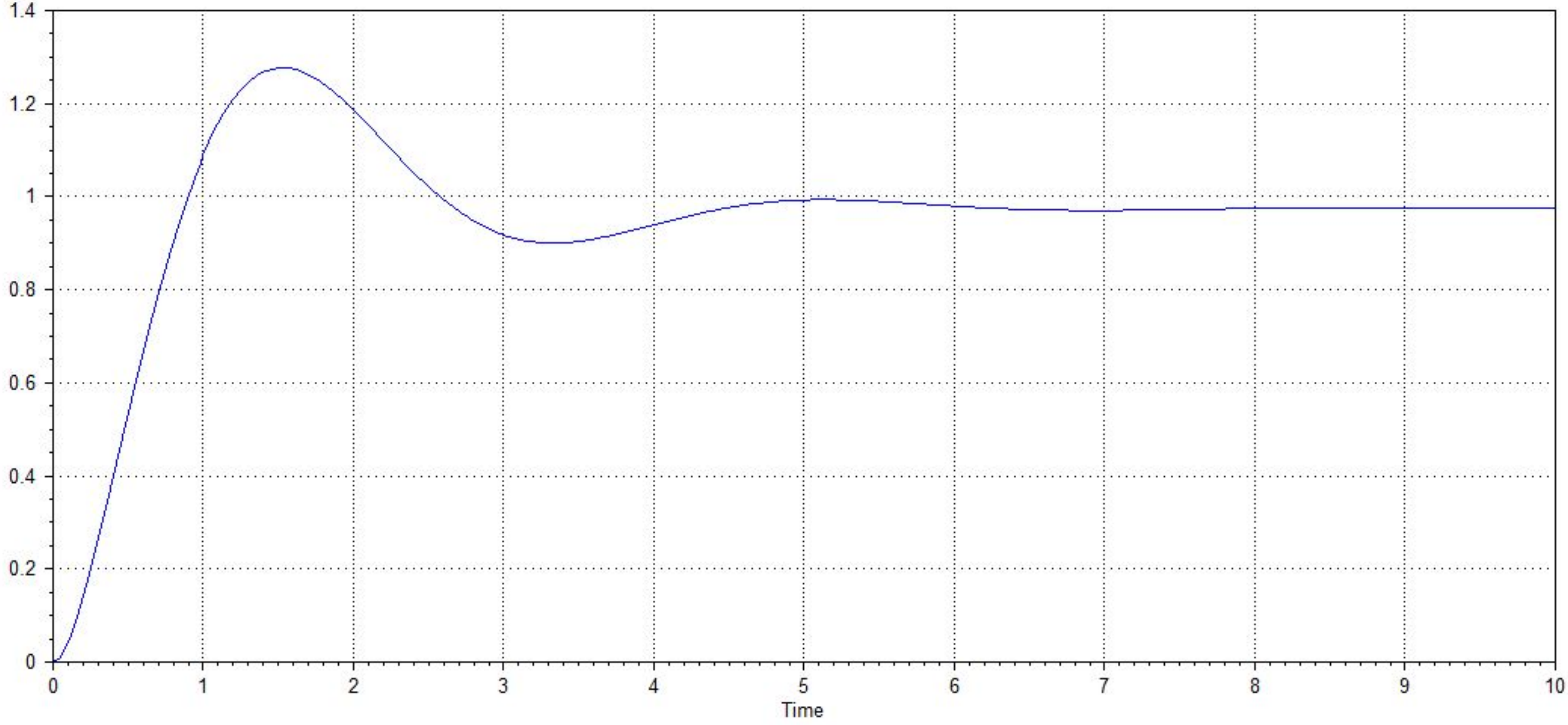
P + I

G0 * Gpi


1000
500
0
-500
-1000
0
10
20
30
40
50
60
70
80
90
100
Time

P + D

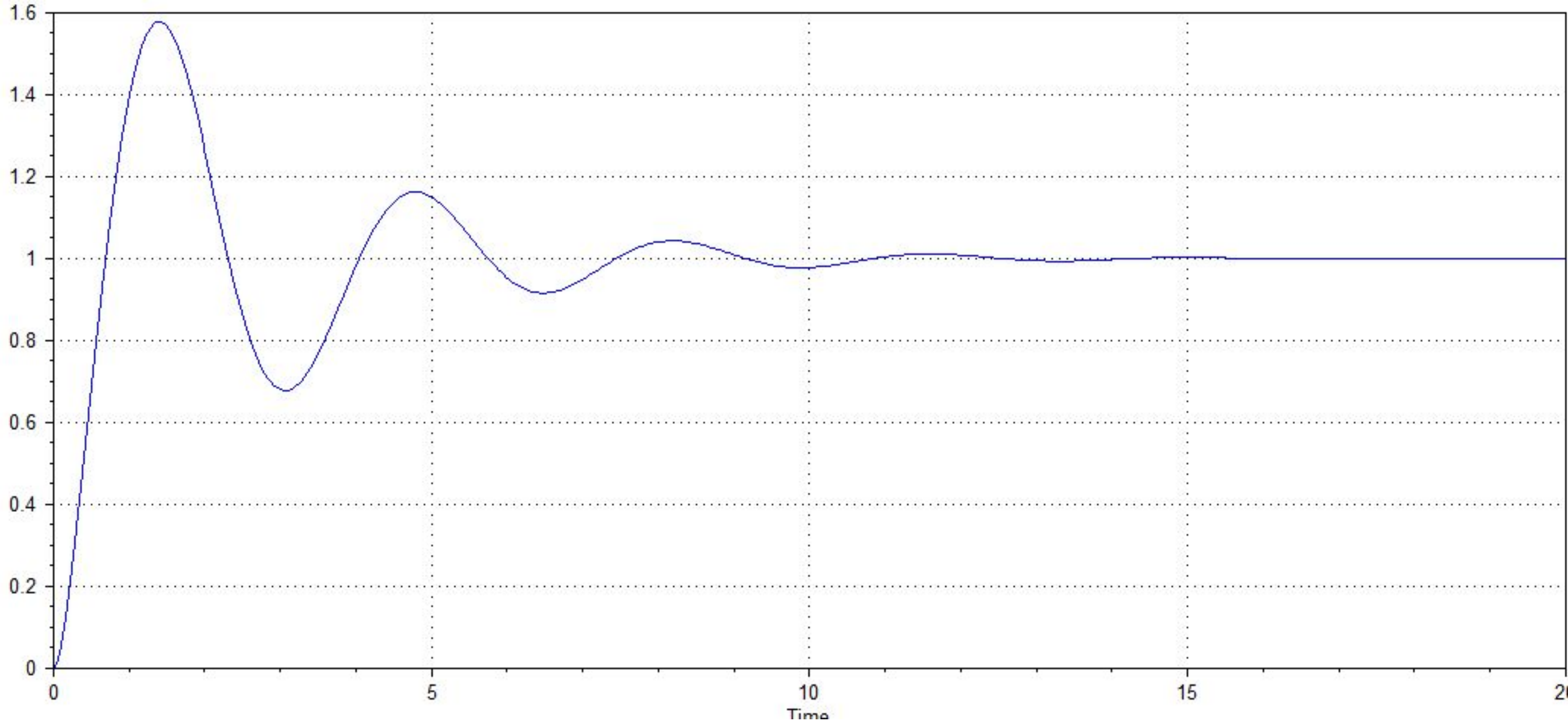
G0 * Gpd



1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
1
2
3
4
5
6
7
8
9
10
Time

P+I+D

G0*Gpid


1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
5
10
15
20
Time