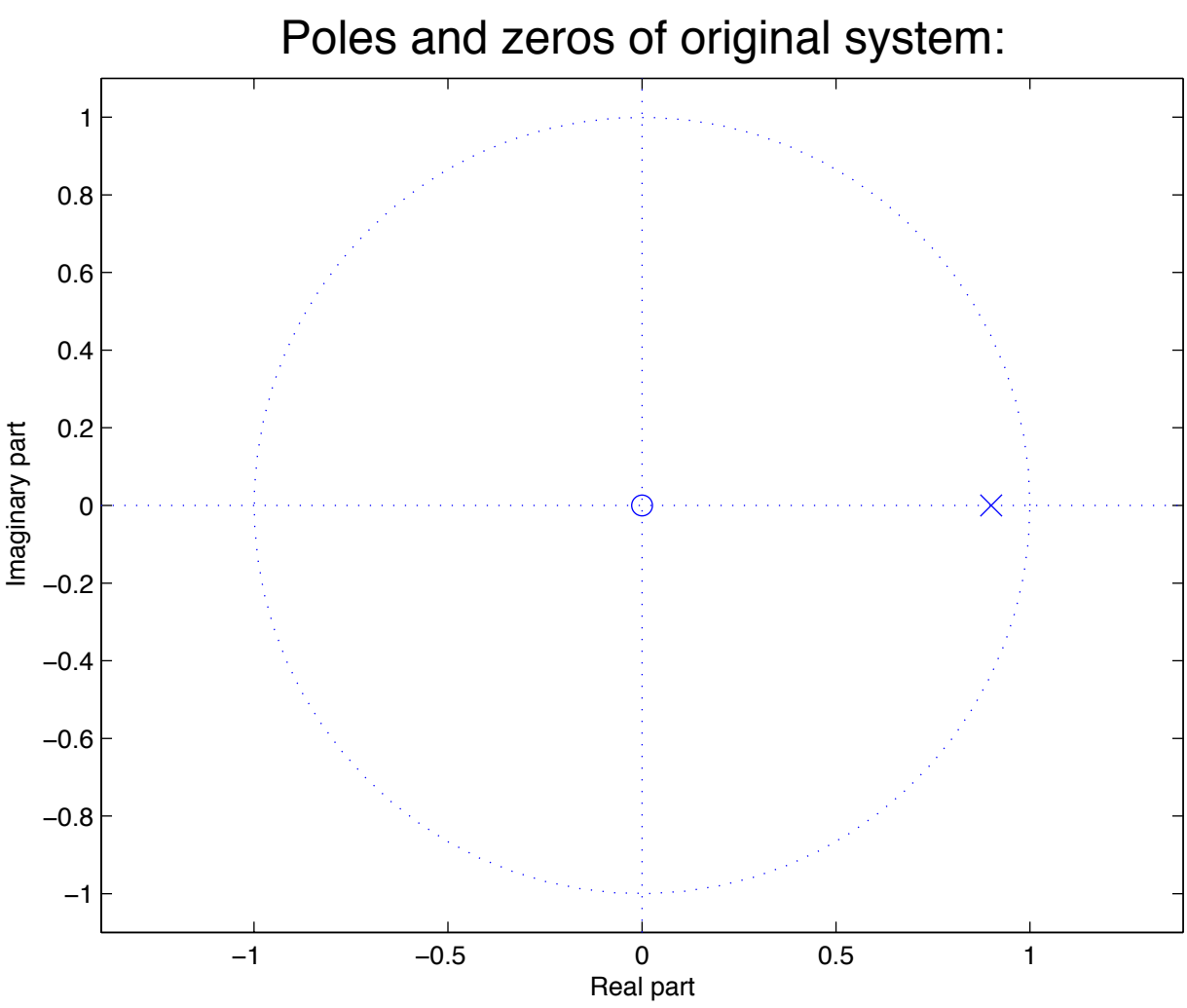
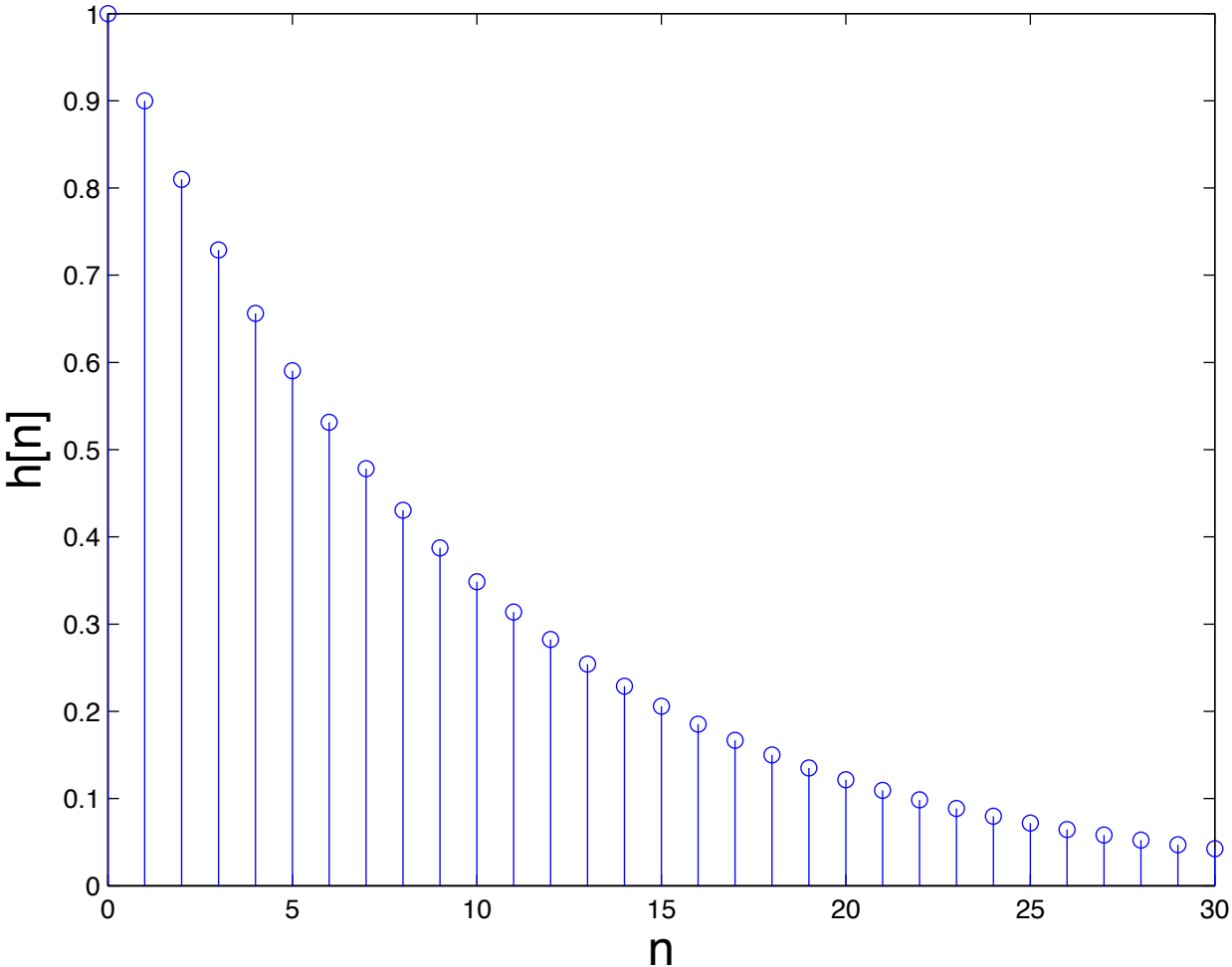
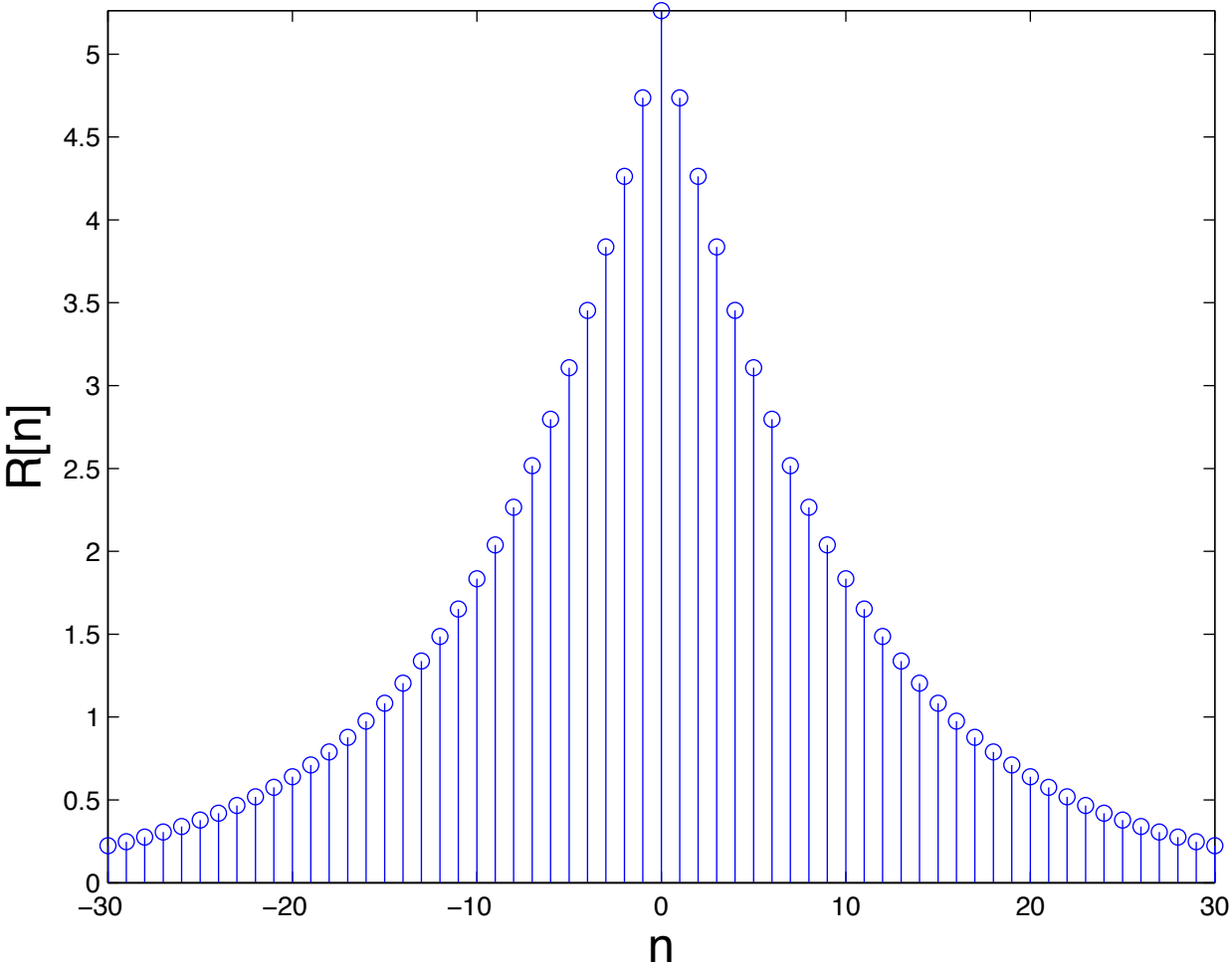
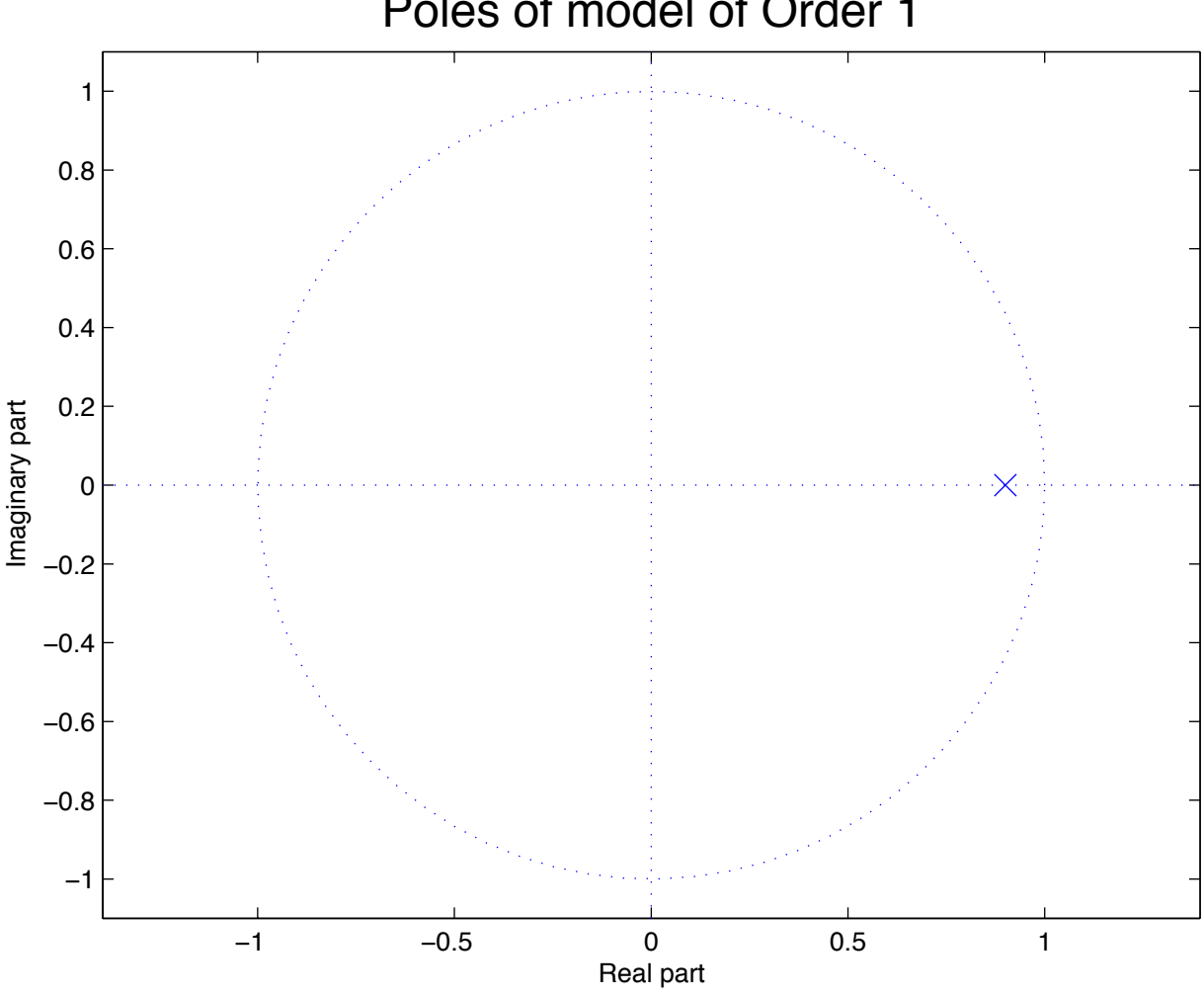
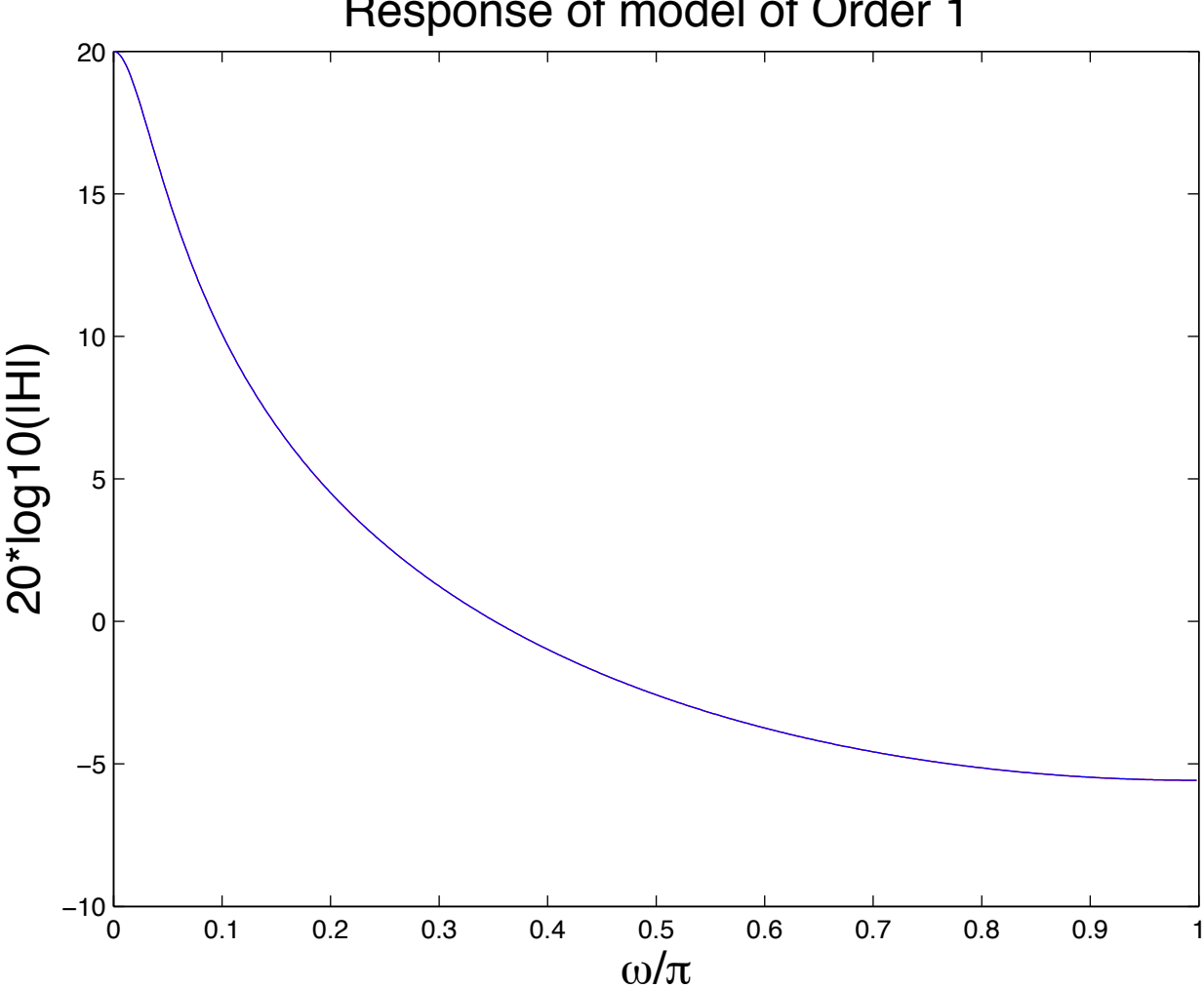
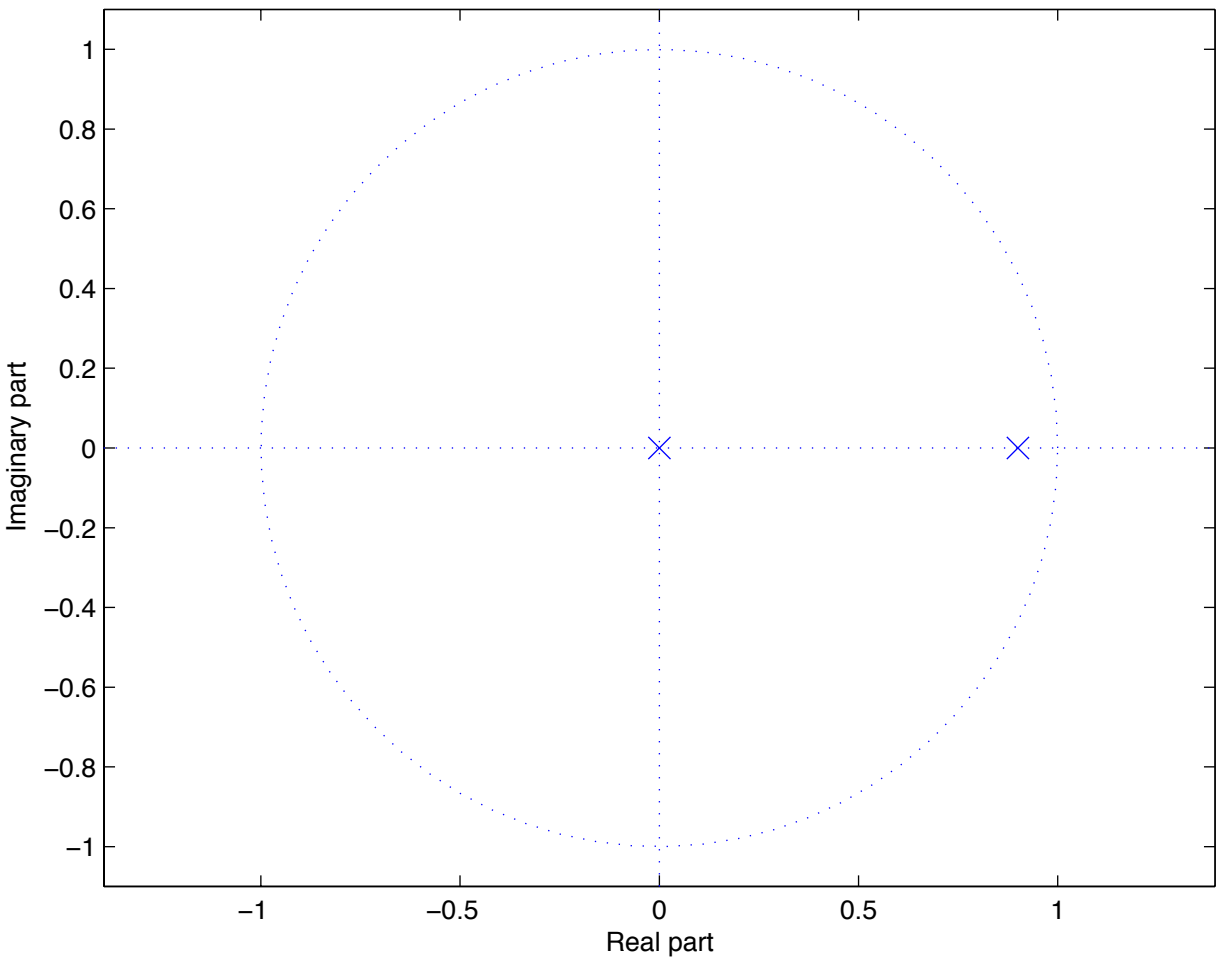

Poles and zeros of original system:
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

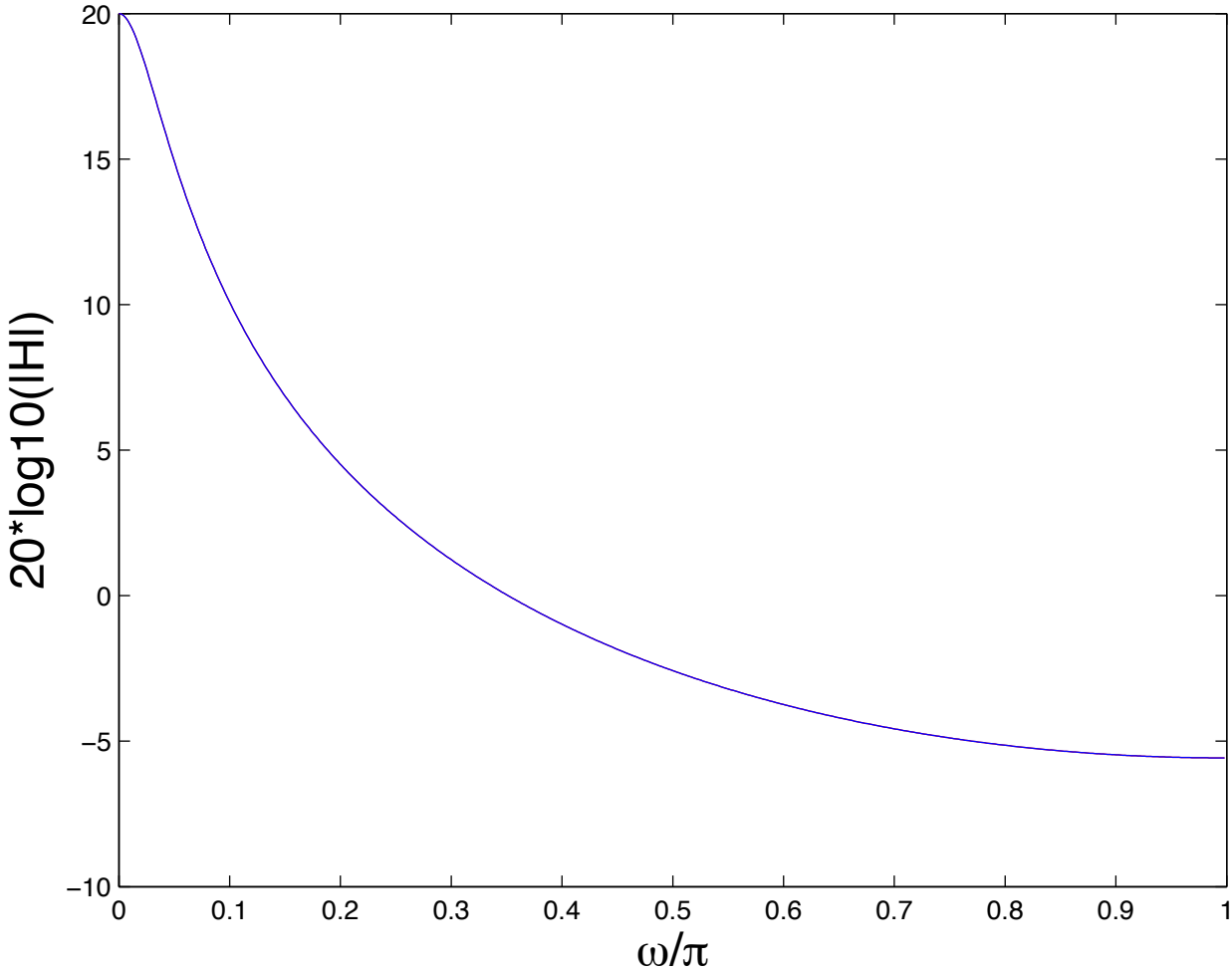

h[n]
n
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0
5
10
15
20
25
30

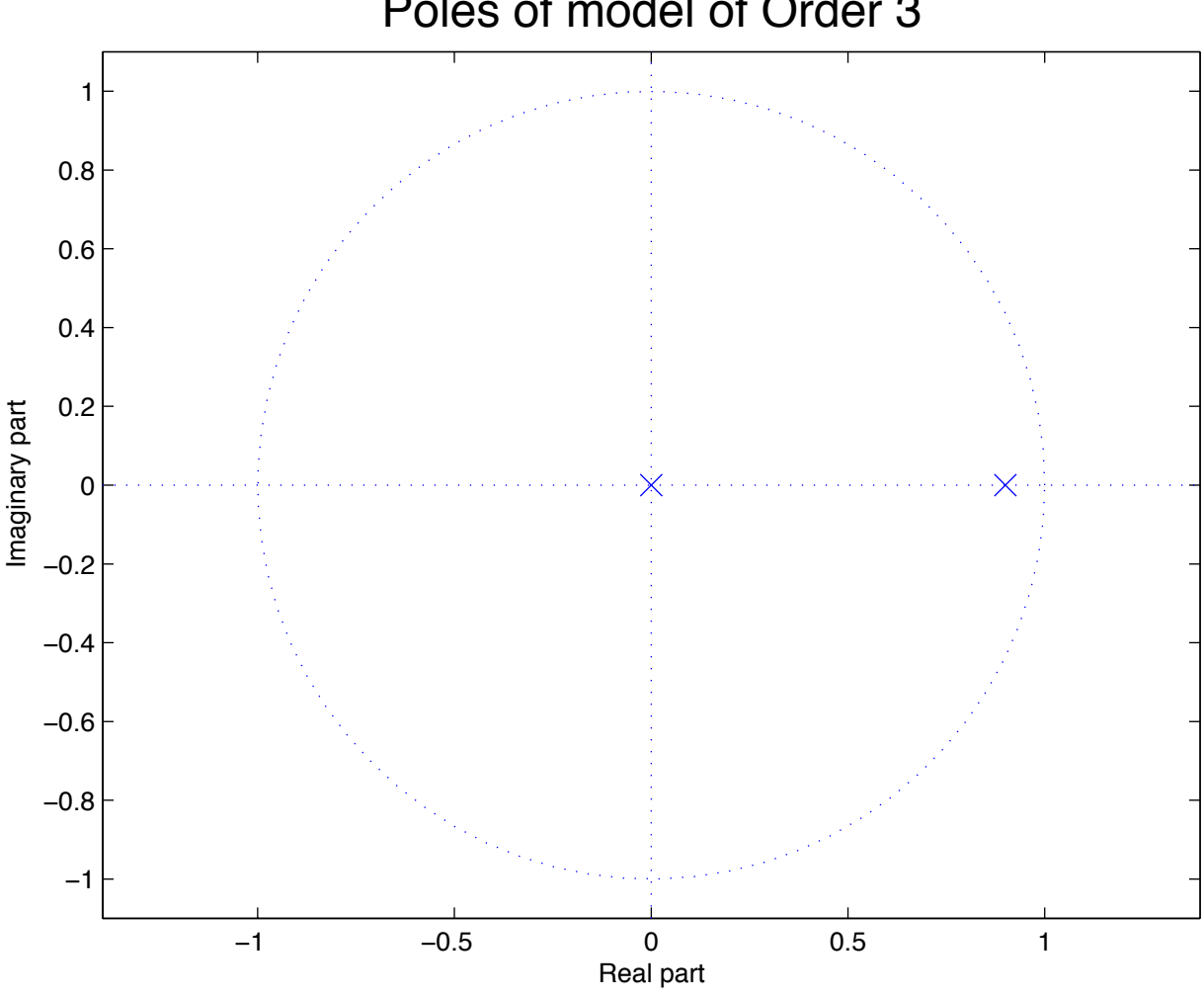

R[n]
n
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
−30
−20
−10
0
10
20
30

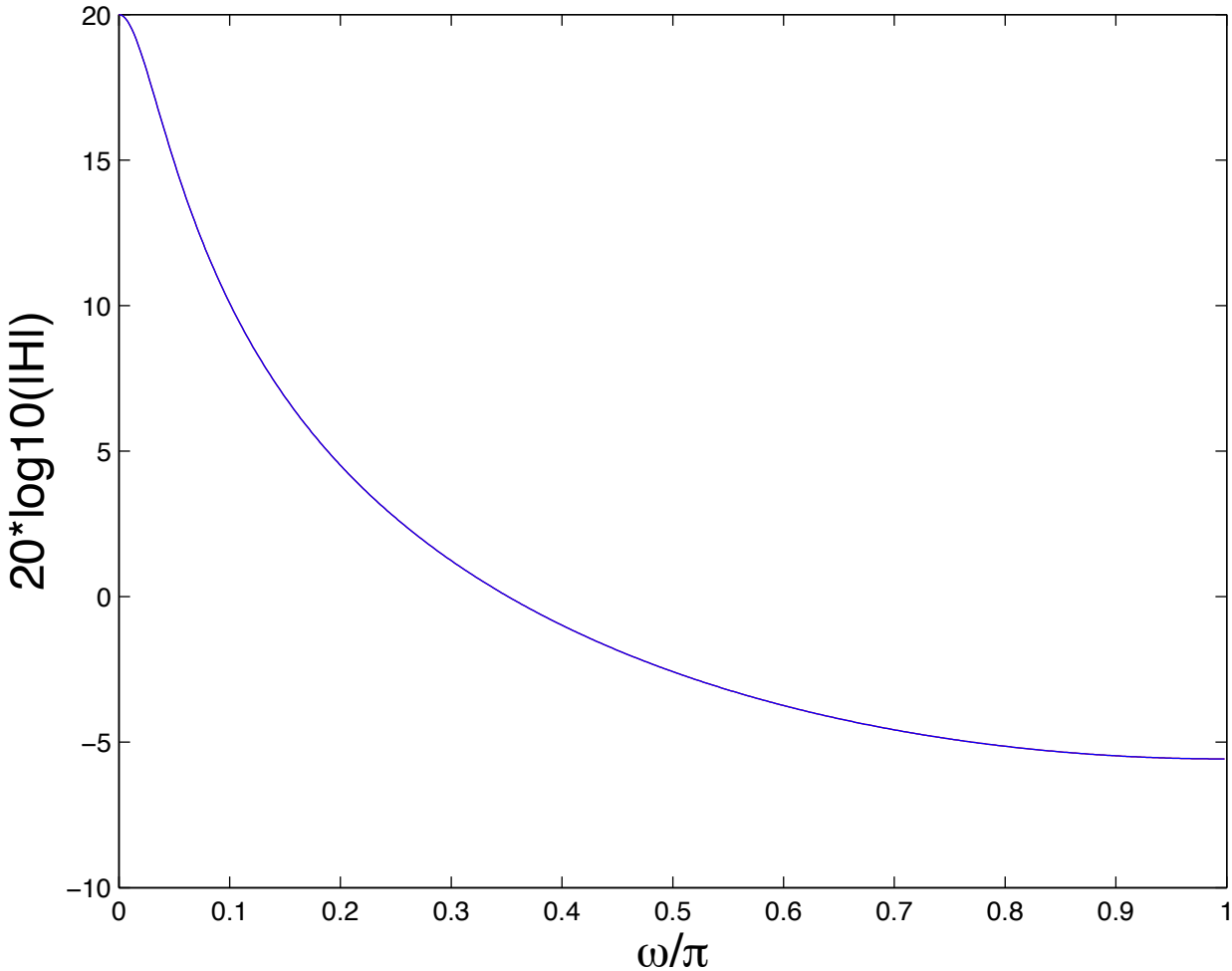

Poles of model of Order 1
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

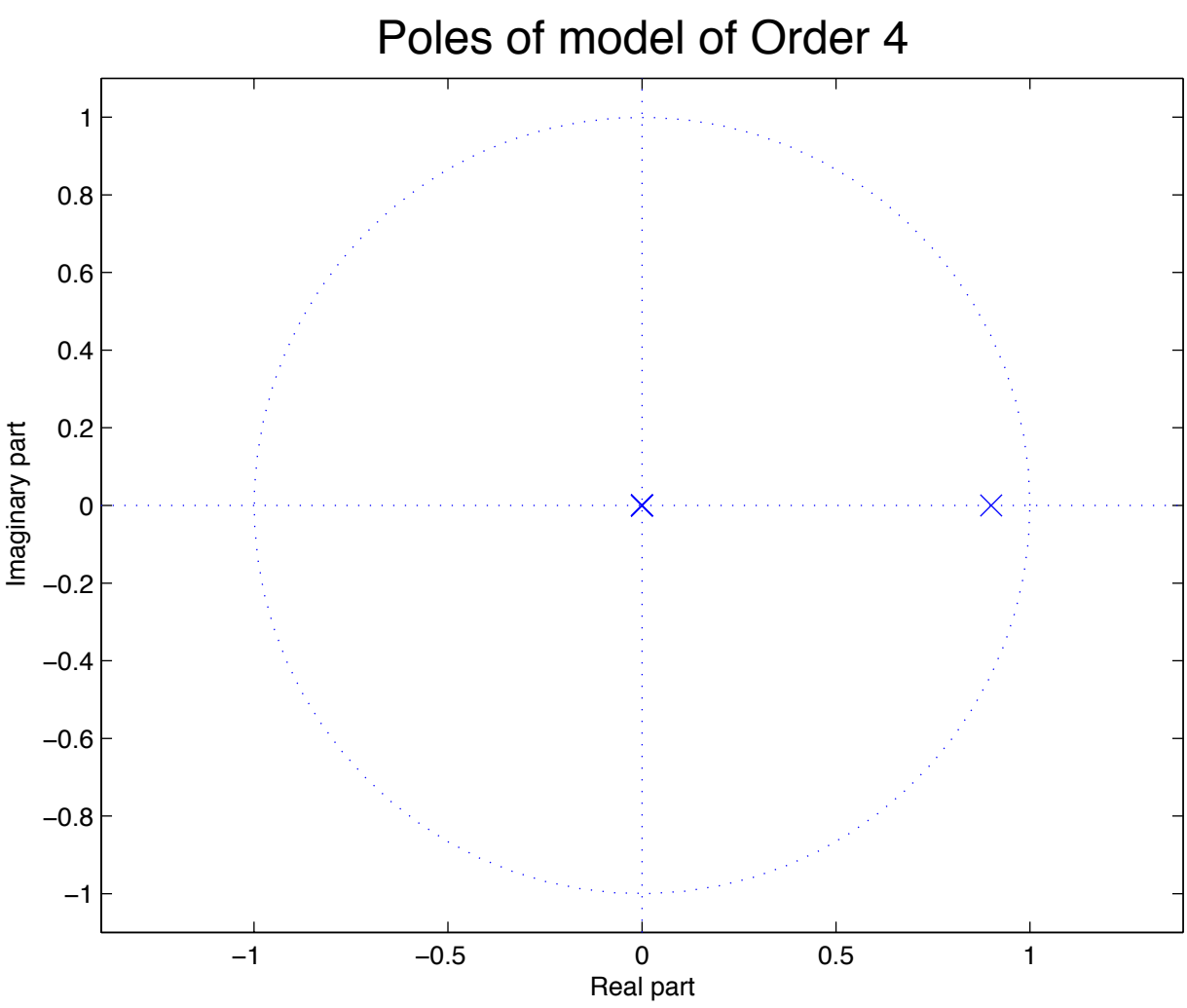

Response of model of Order 1
20*log10(|H|)
20
15
10
5
0
−5
−10
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

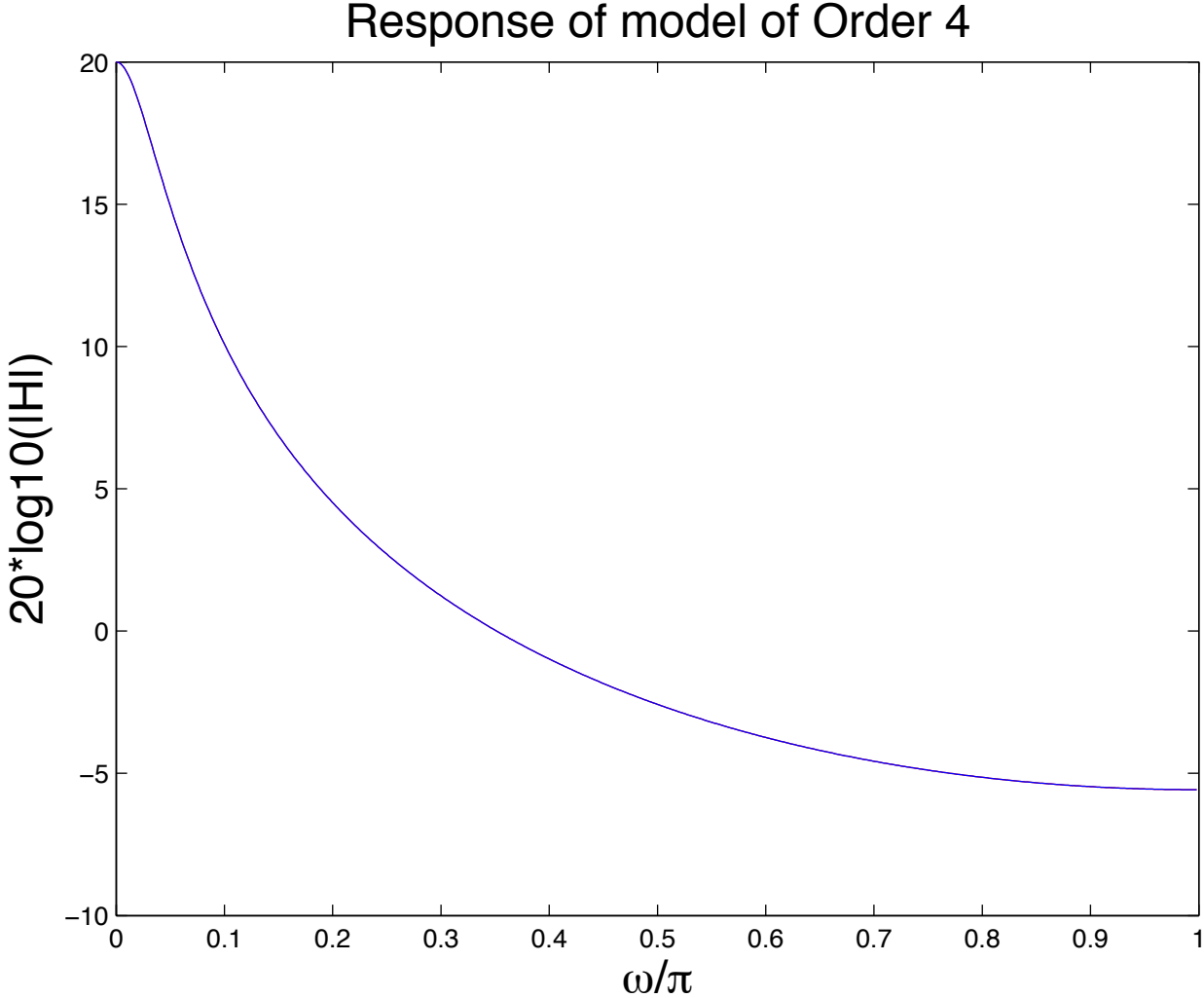

Poles of model of Order 2
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

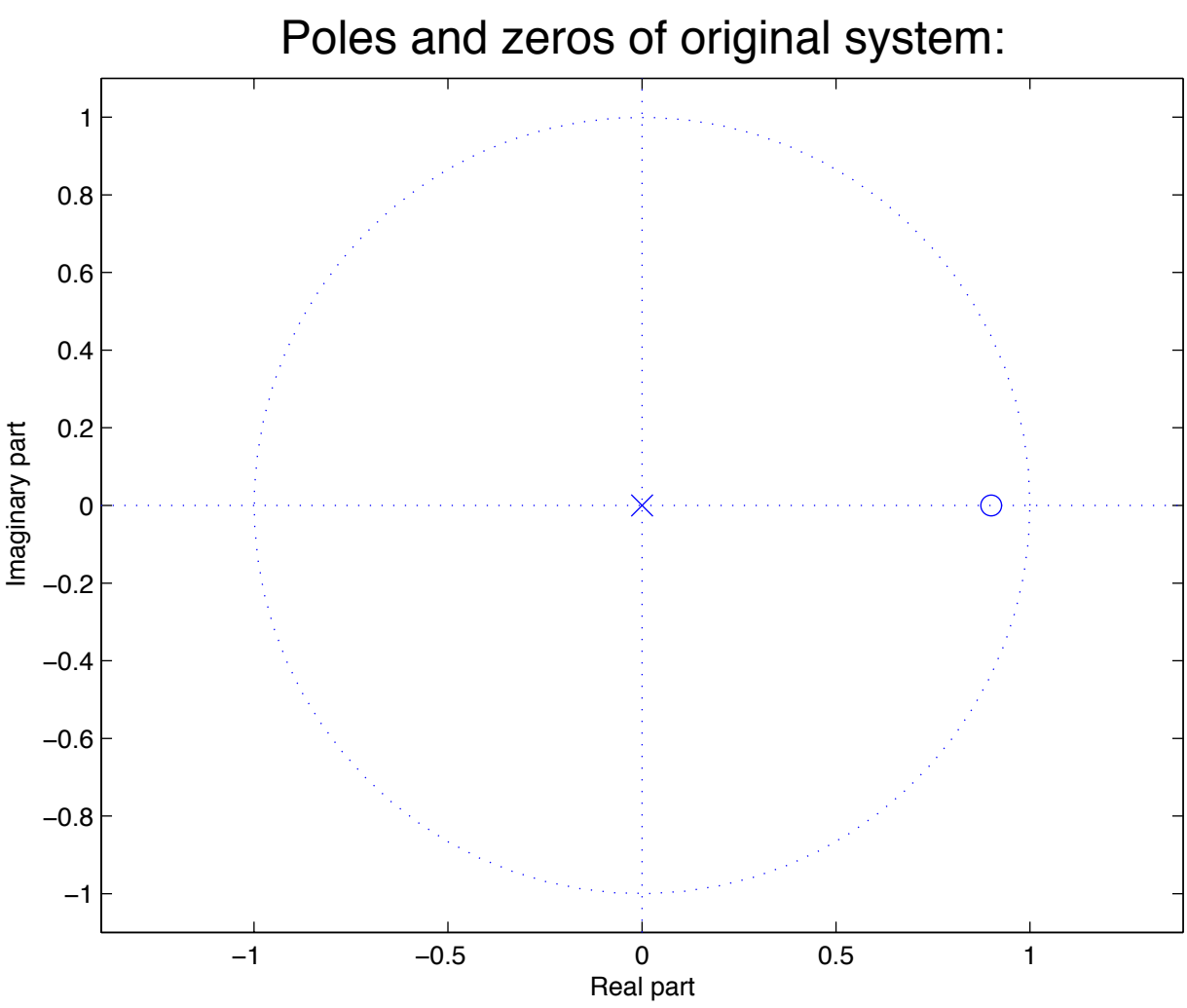

Response of model of Order 2
20*log10(|H|)
20
15
10
5
0
−5
−10
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

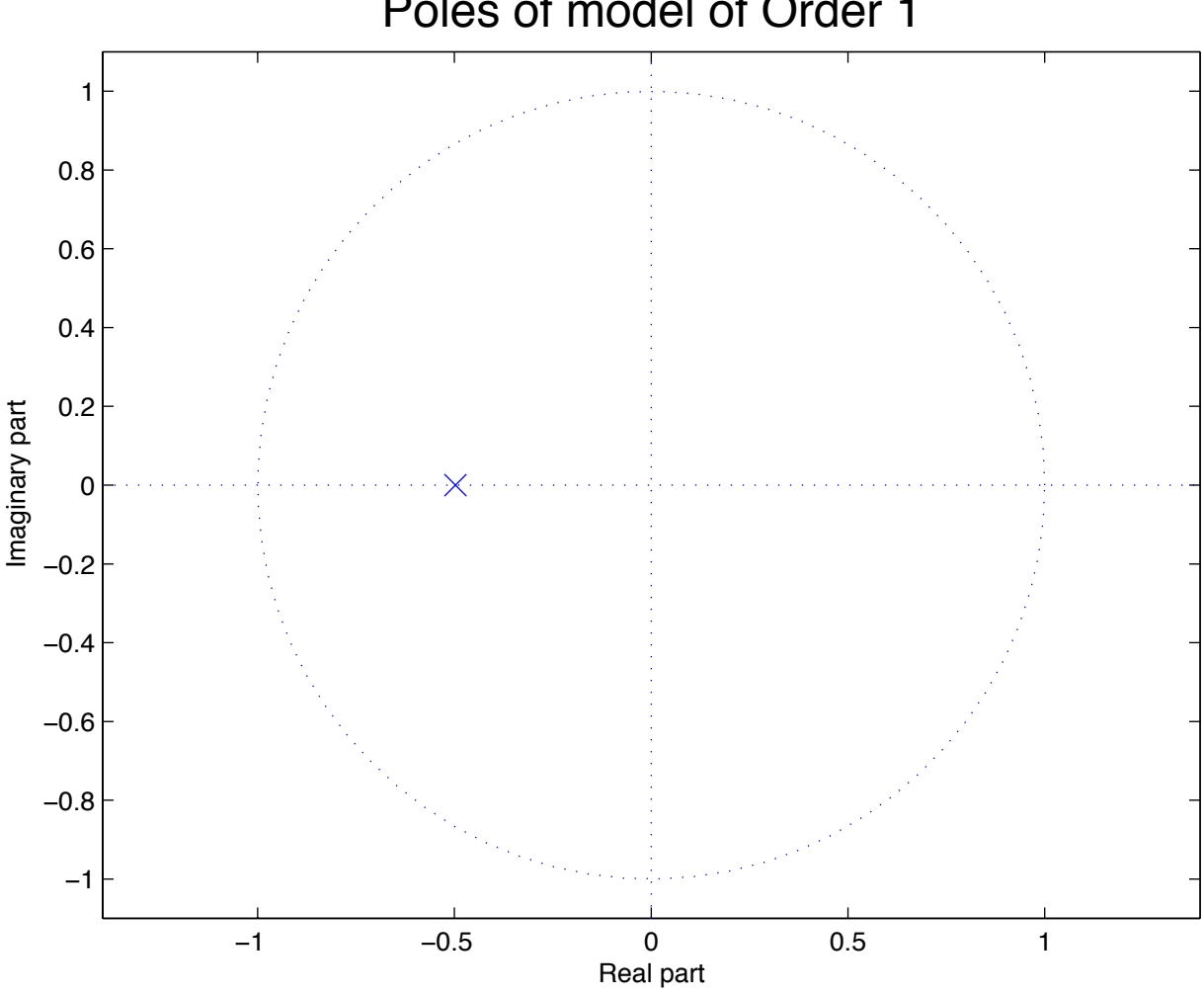

Poles of model of Order 3
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

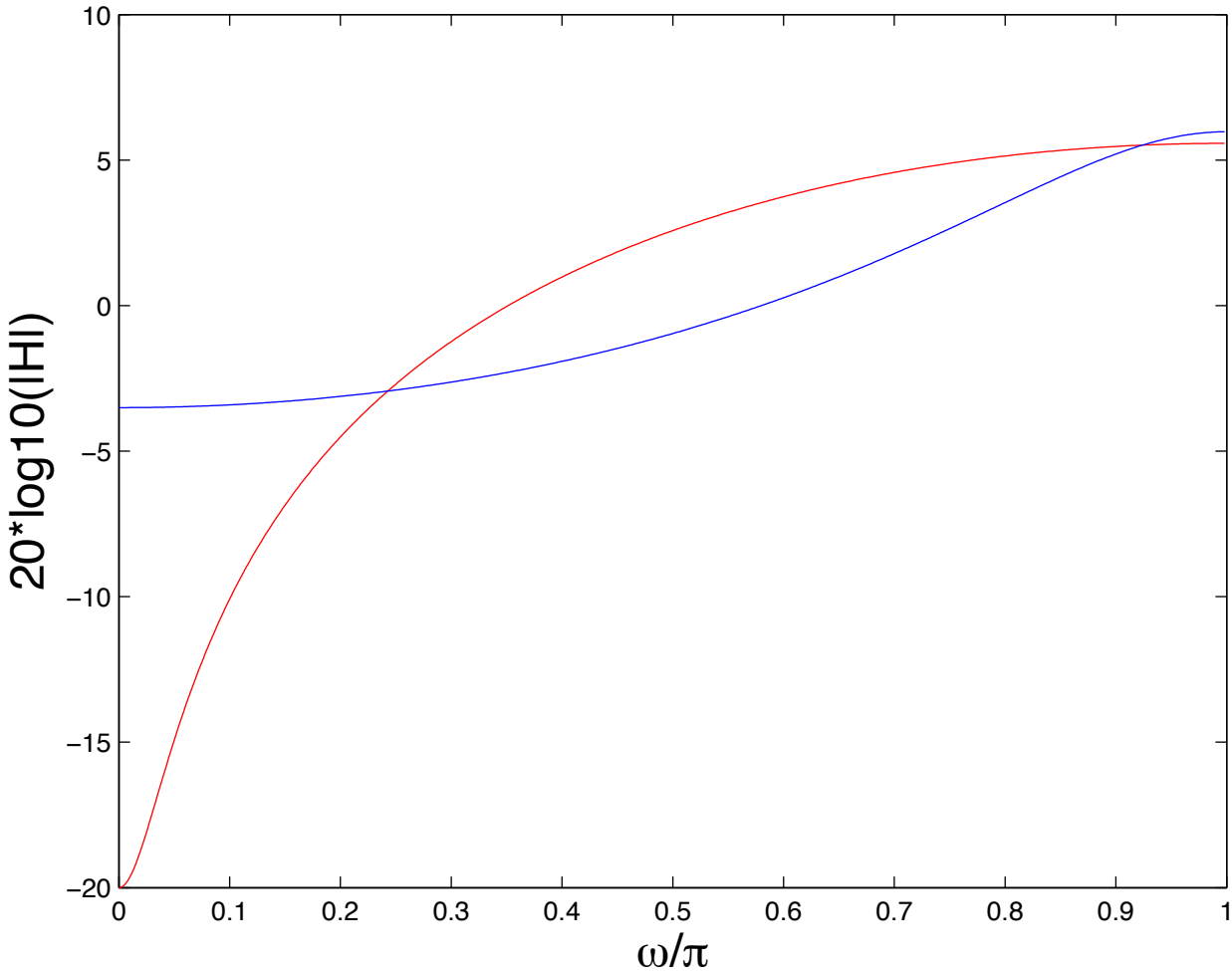

Response of model of Order 3
20*log10(|H|)
20
15
10
5
0
−5
−10
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

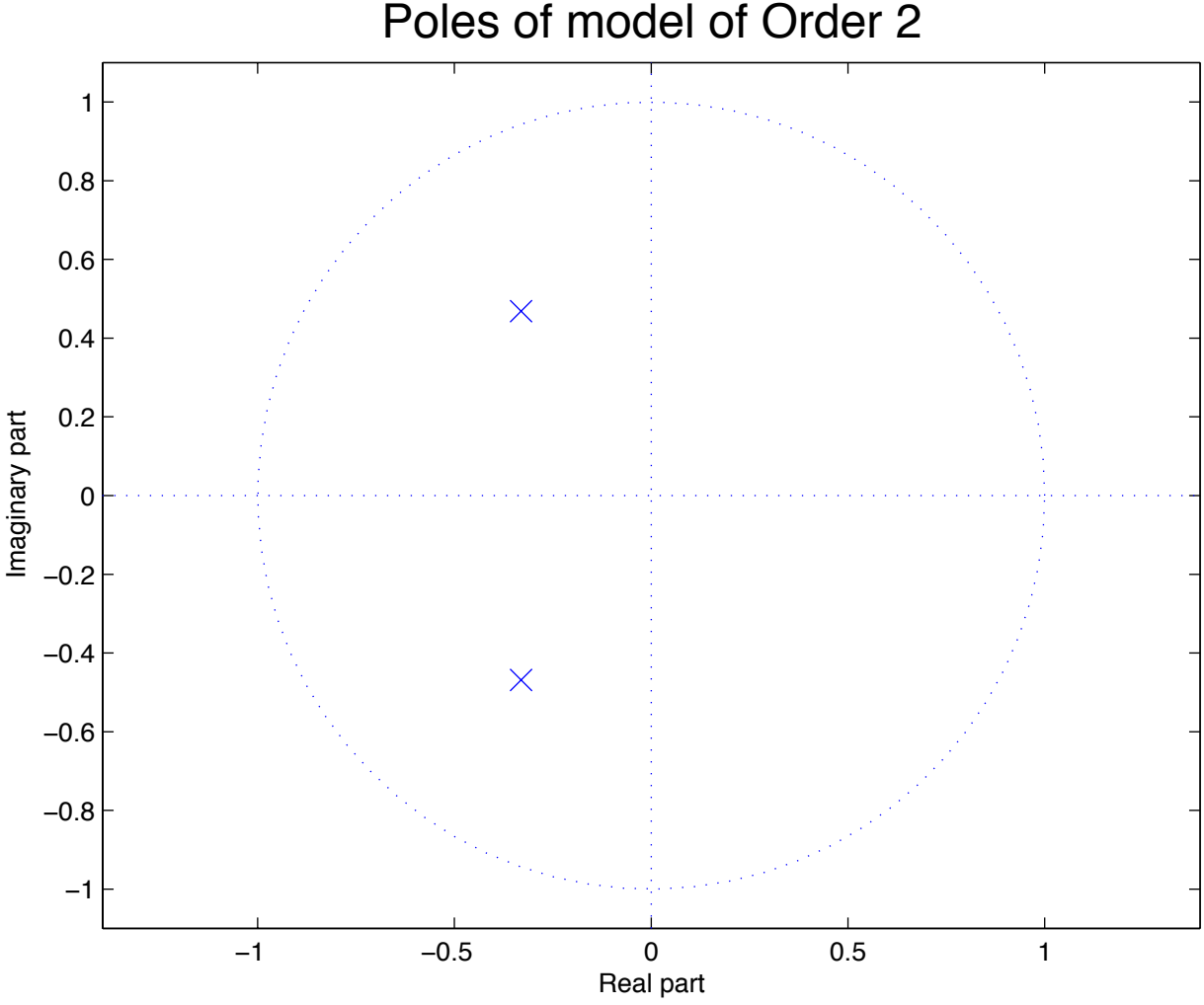

Poles of model of Order 4
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

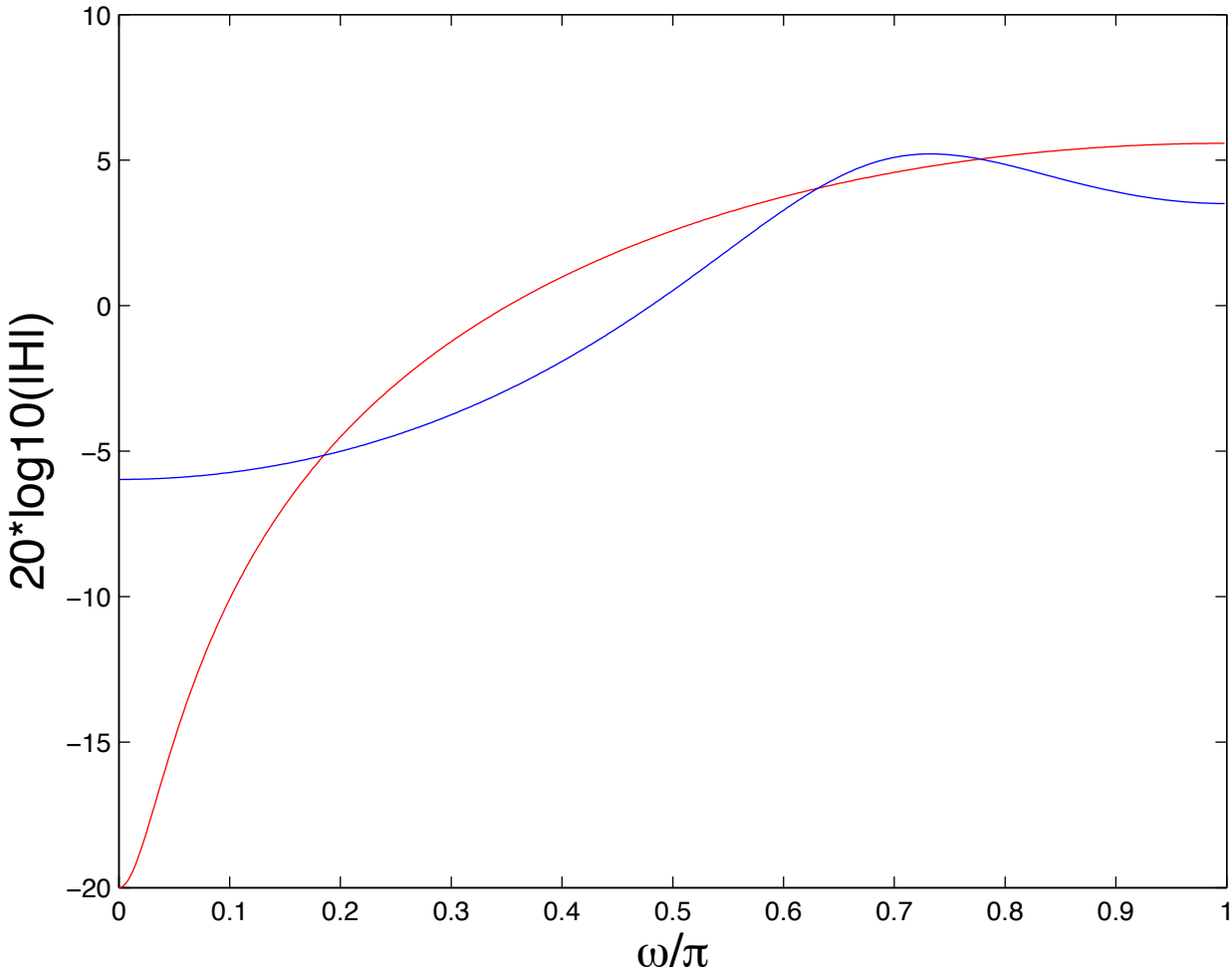

Response of model of Order 4
20*log10(|H|)
20
15
10
5
0
−5
−10
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

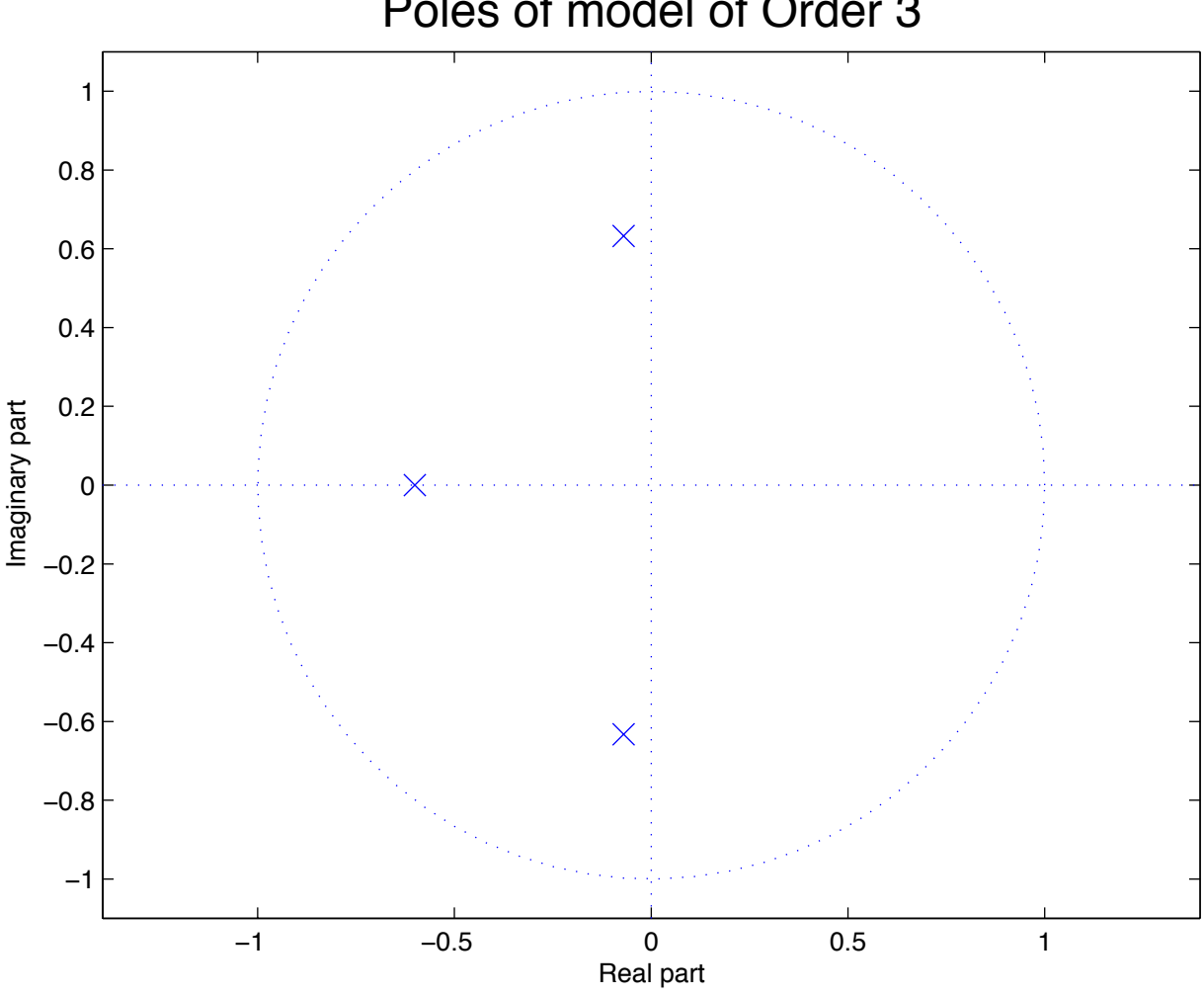

Poles and zeros of original system:
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

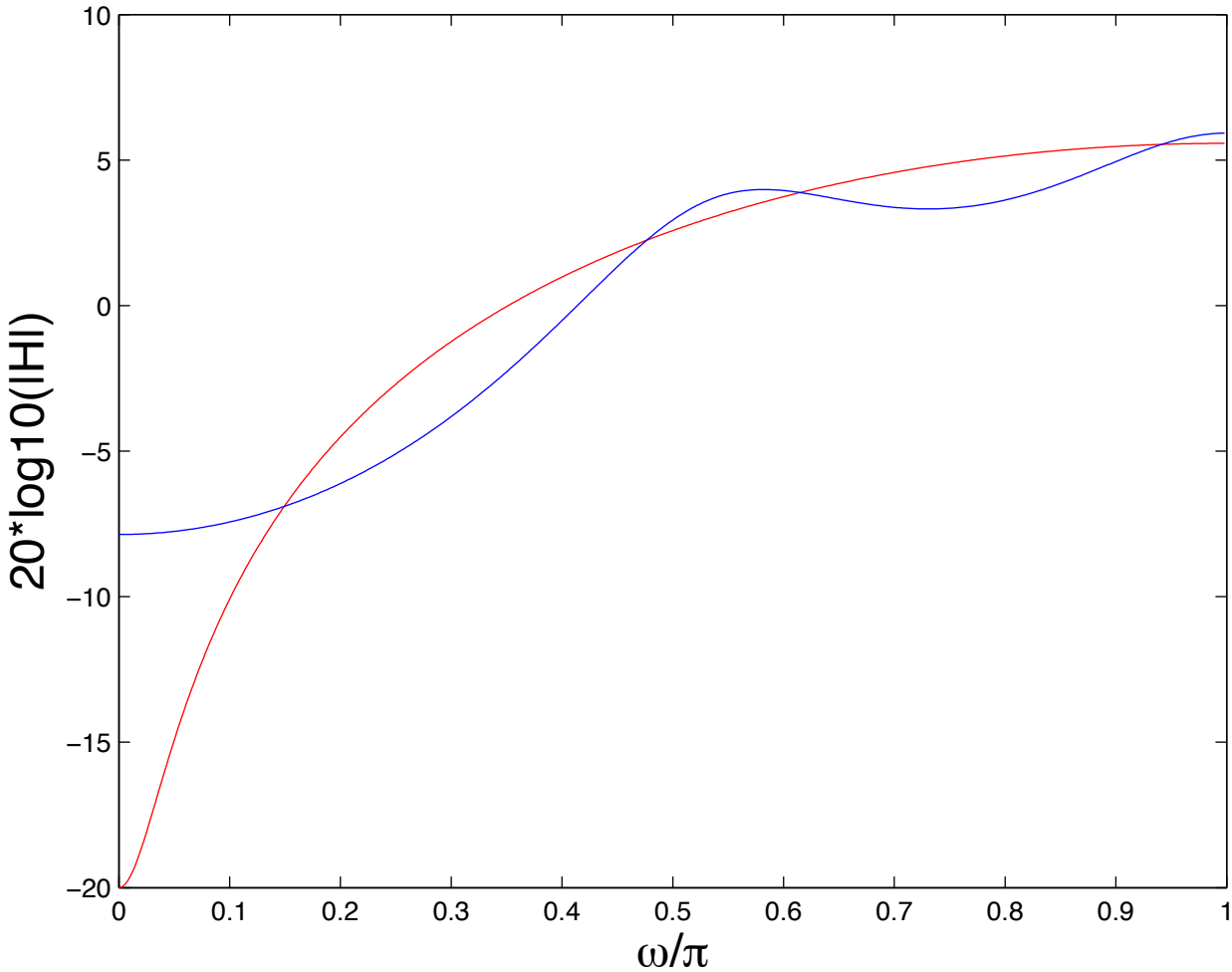

Poles of model of Order 1
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

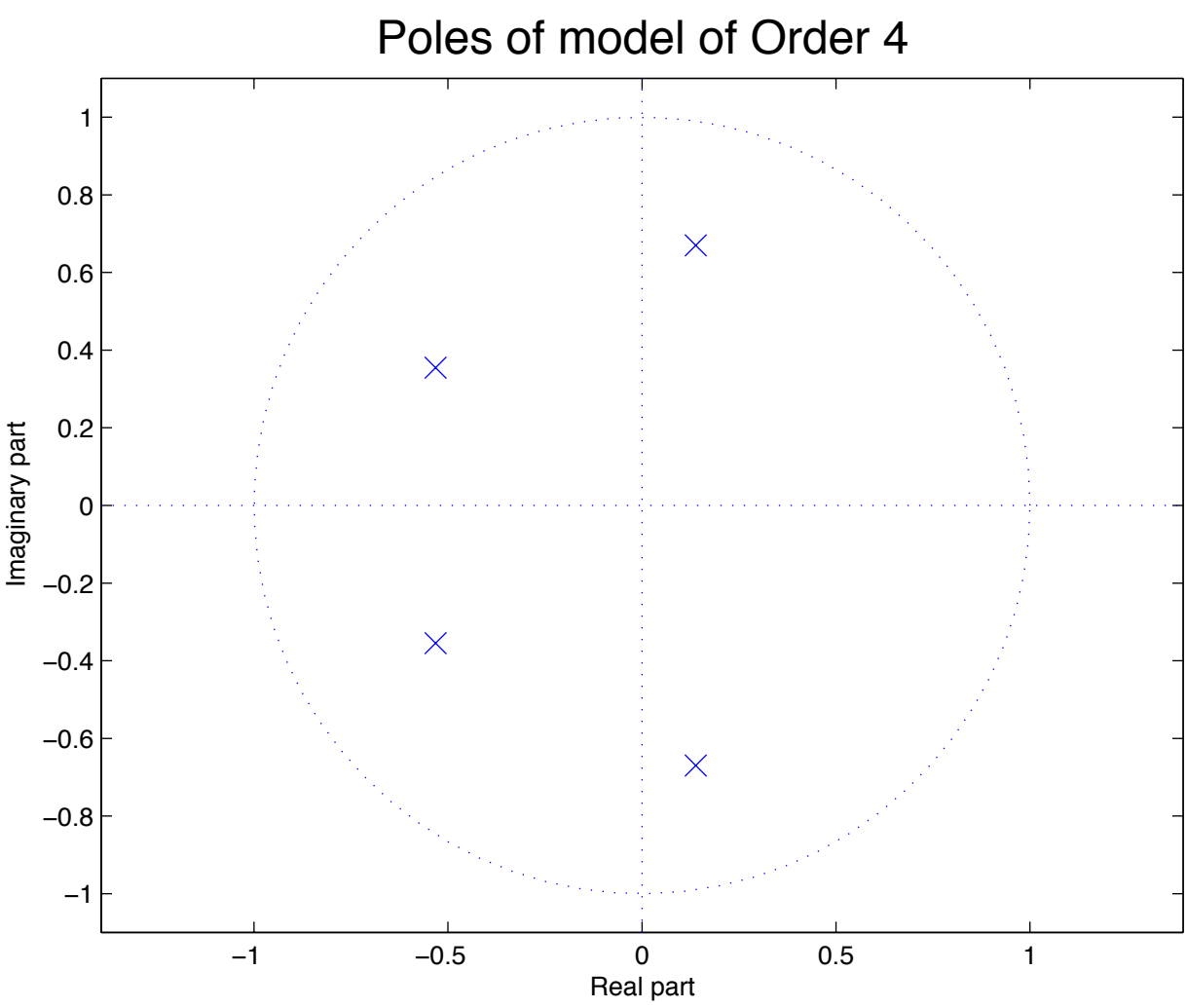

Response of model of Order 1
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

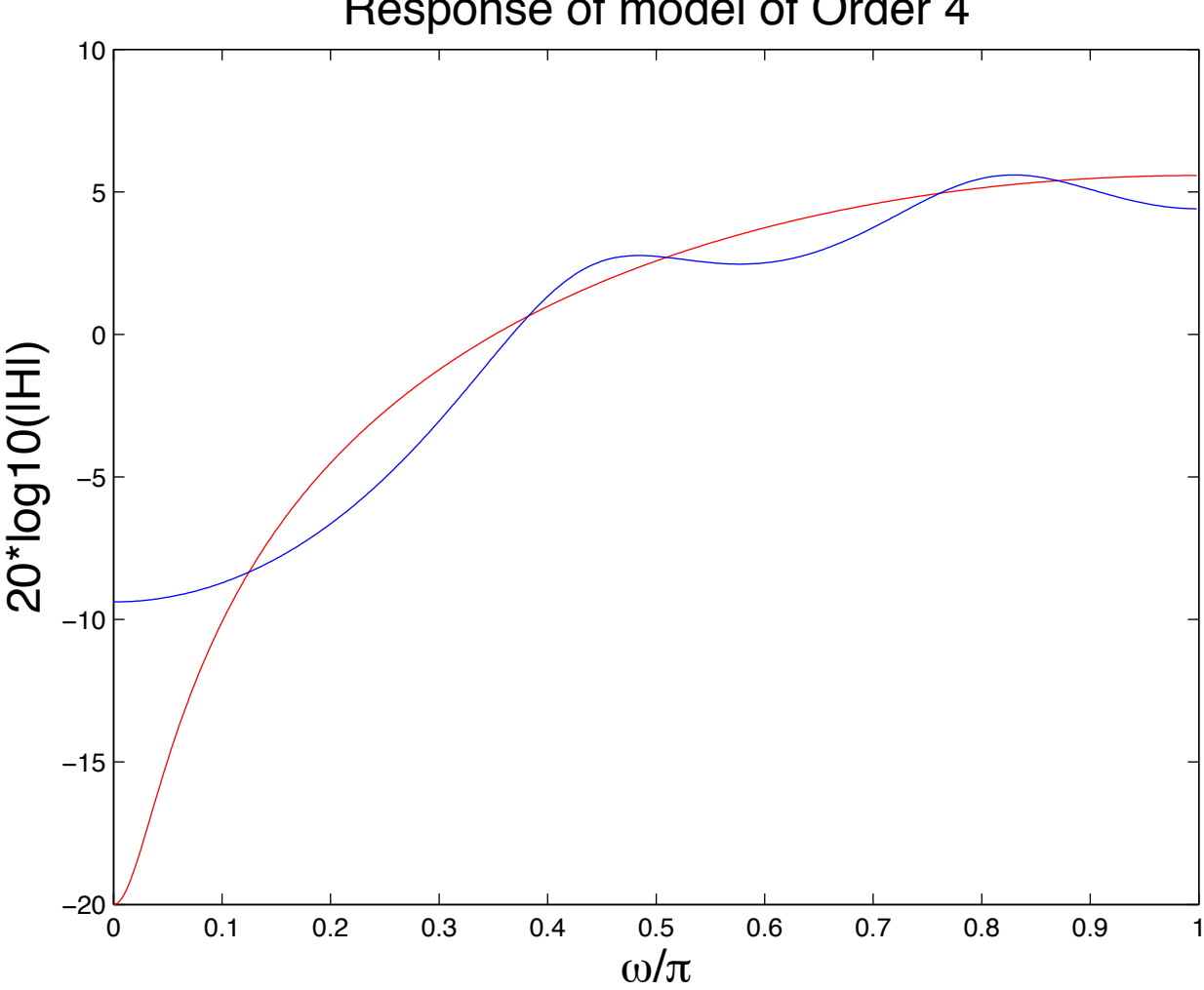

Poles of model of Order 2
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

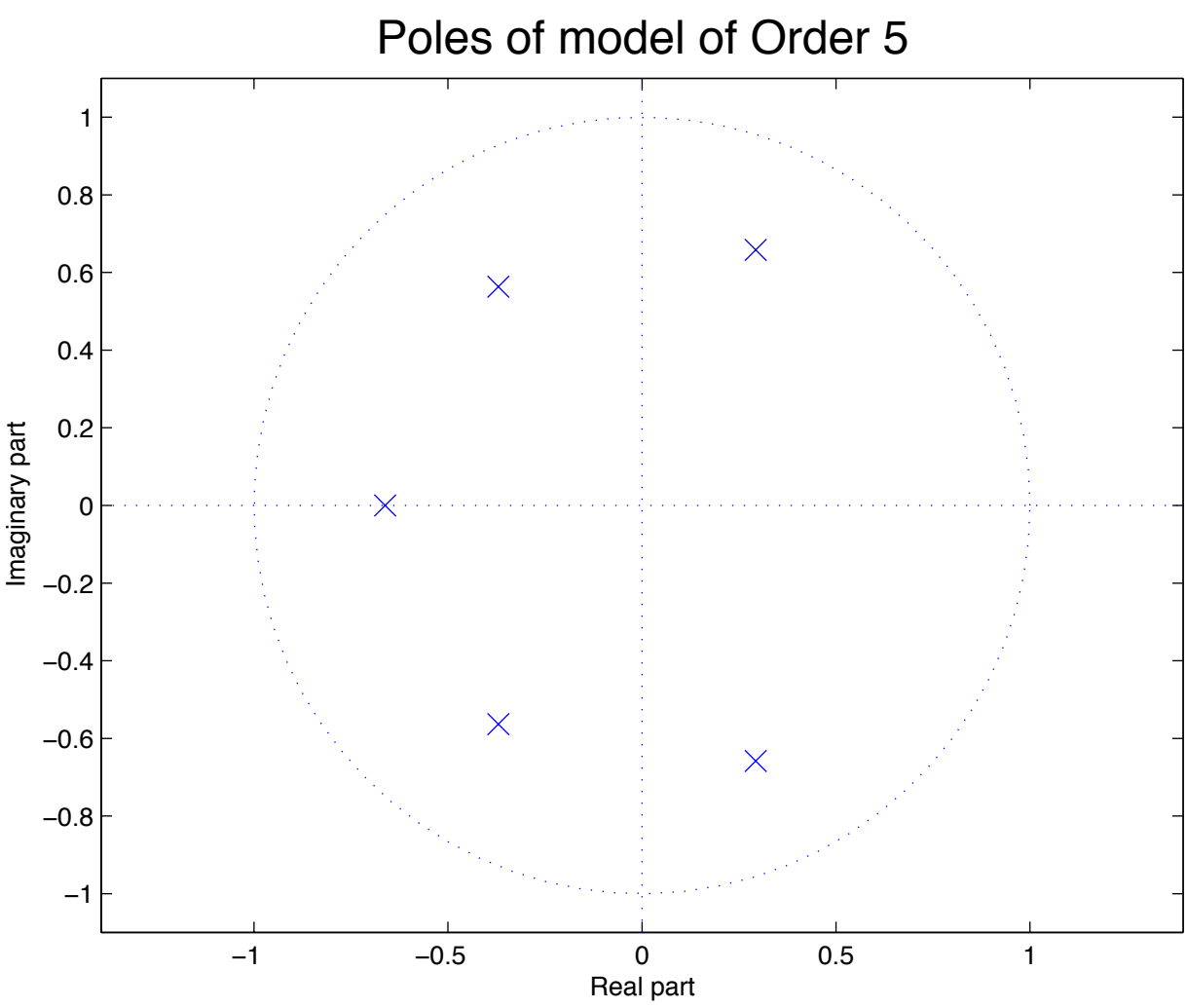

Response of model of Order 2
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

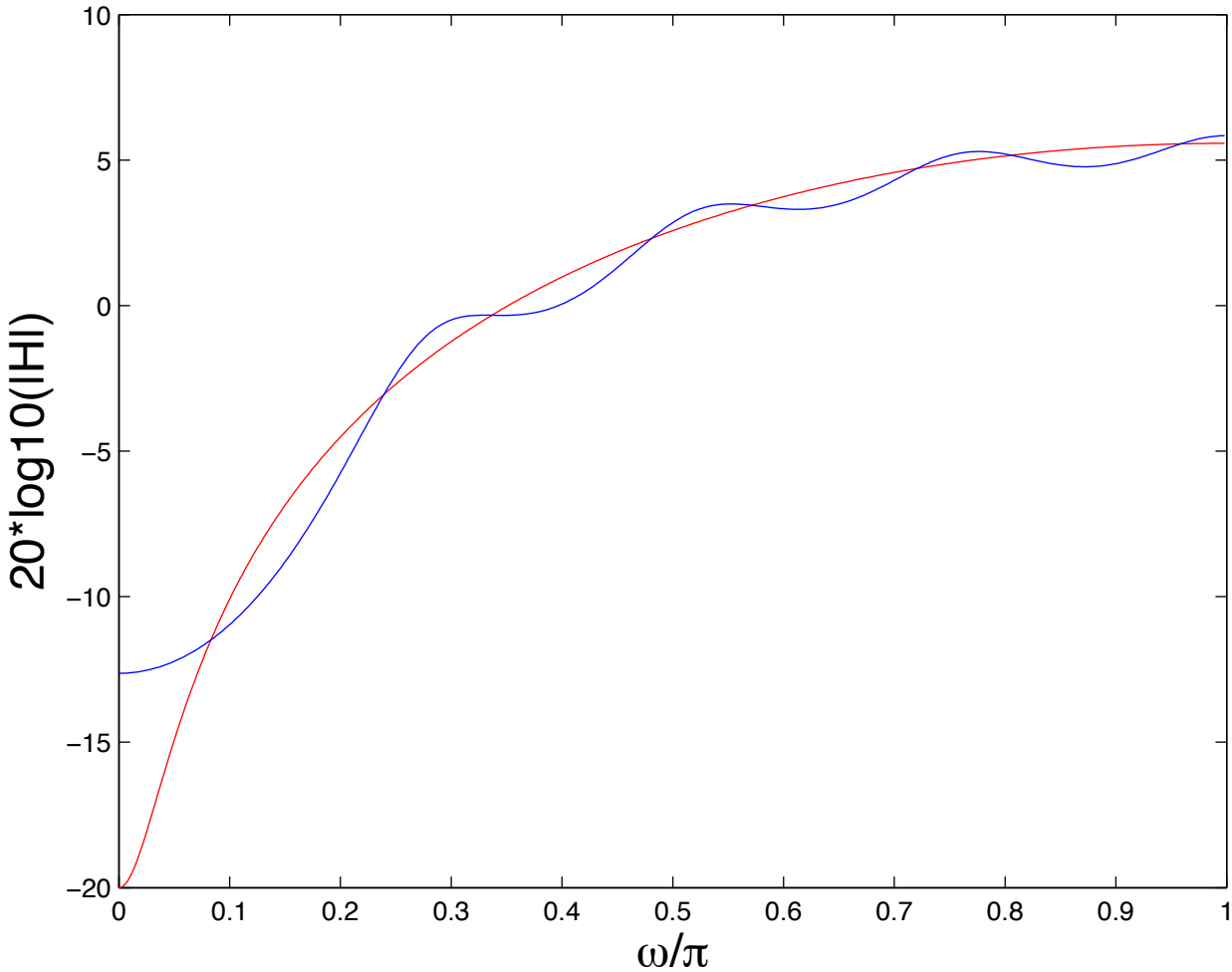

Poles of model of Order 3
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

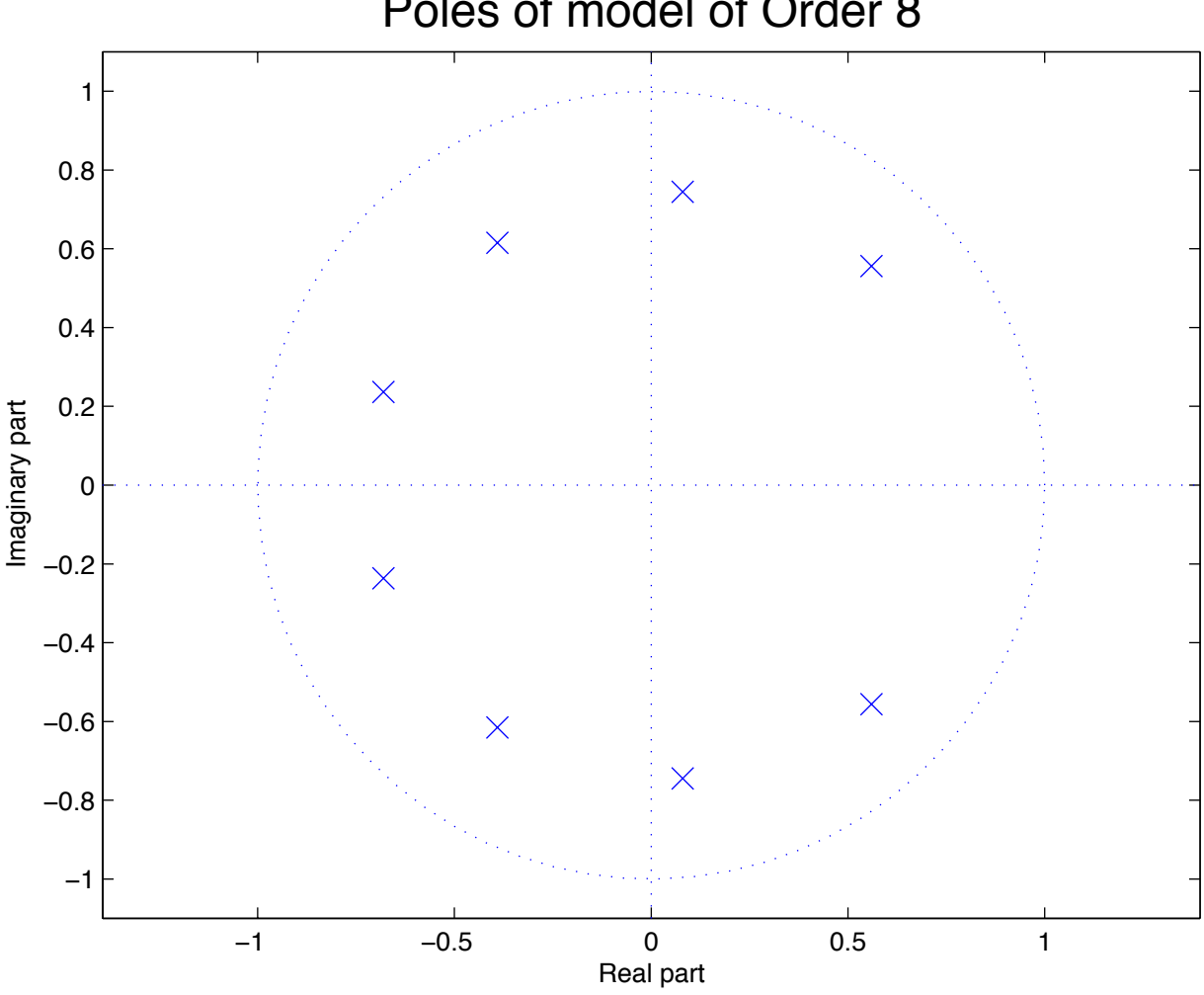

Response of model of Order 3
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

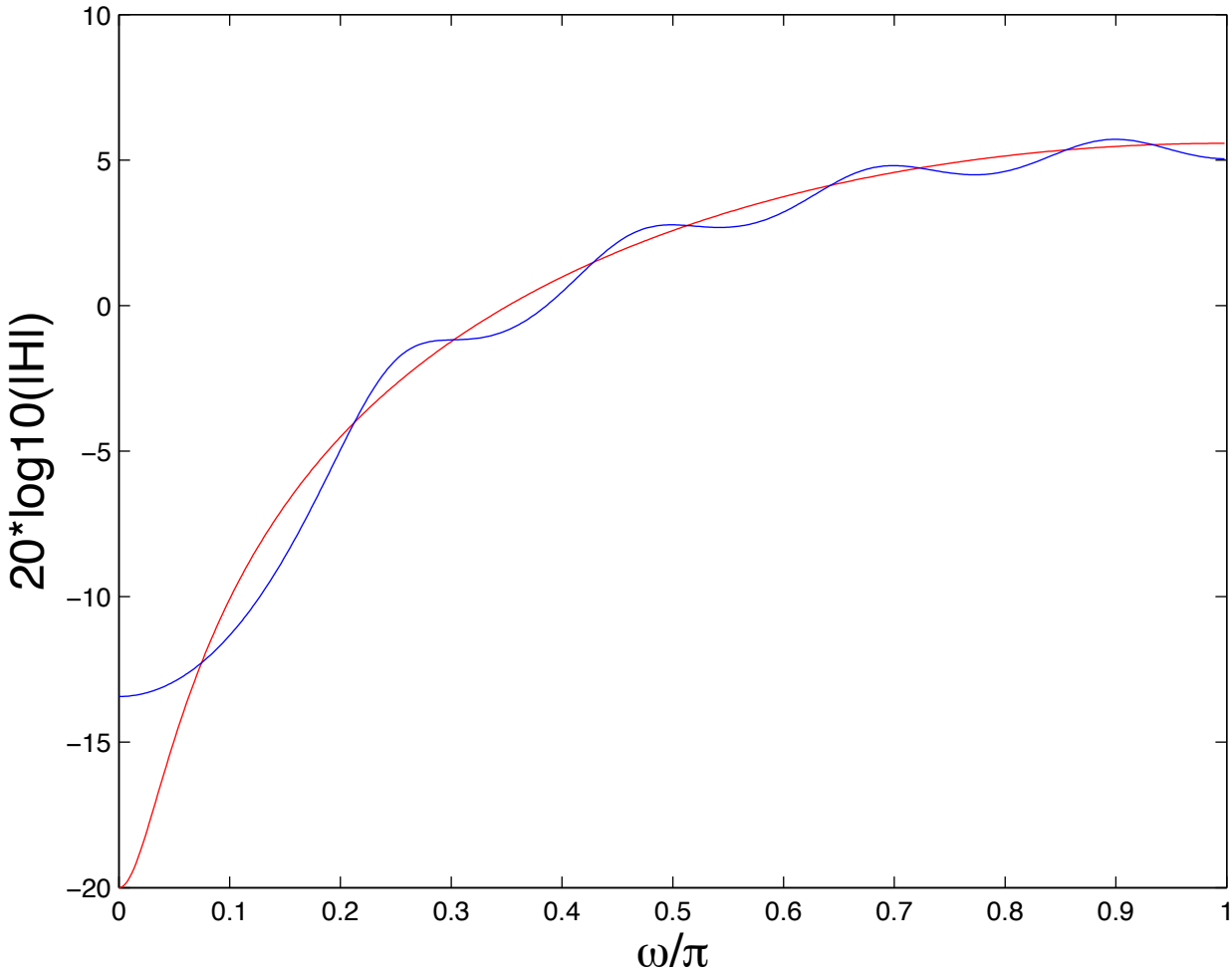

Poles of model of Order 4
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

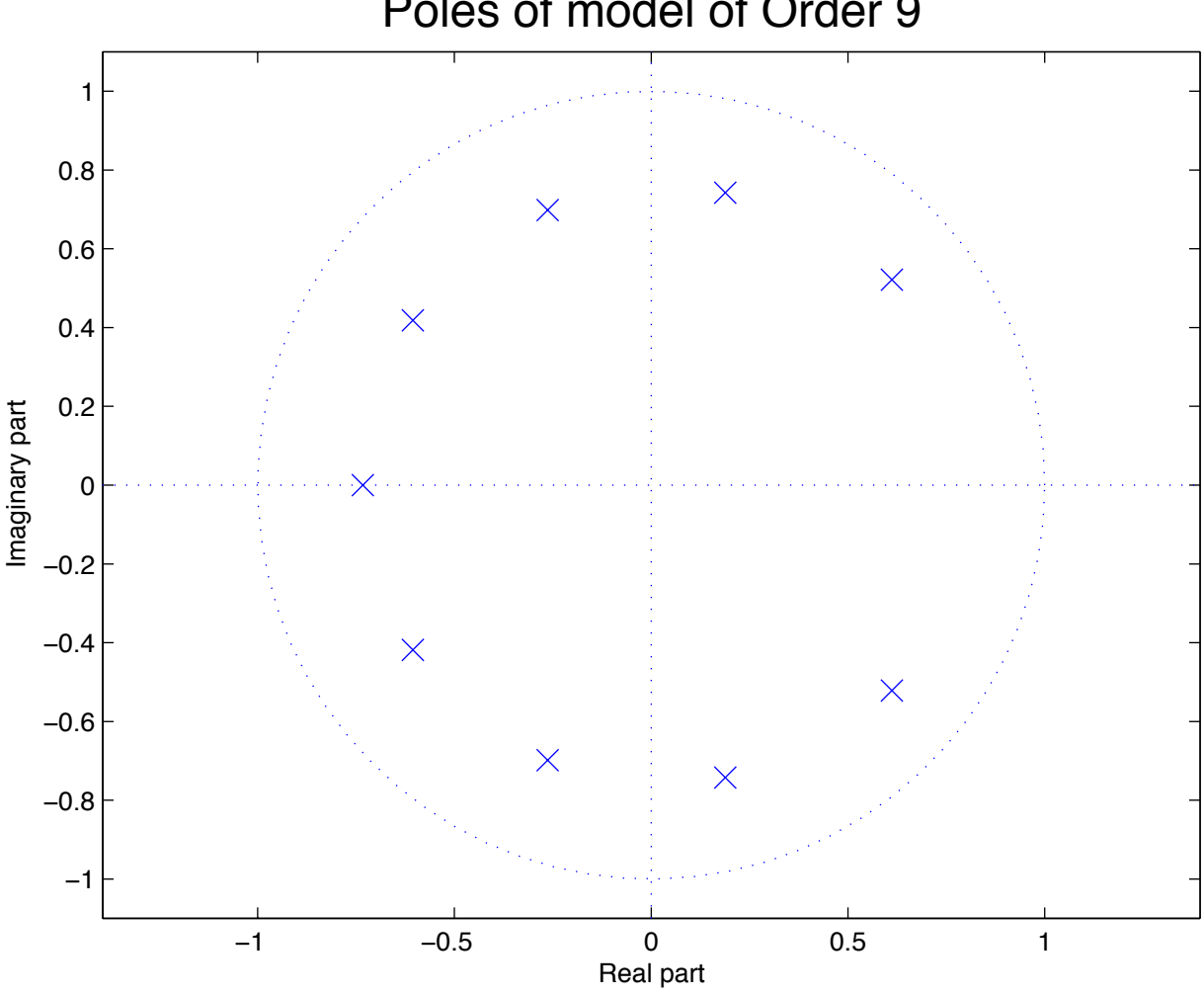

Response of model of Order 4
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

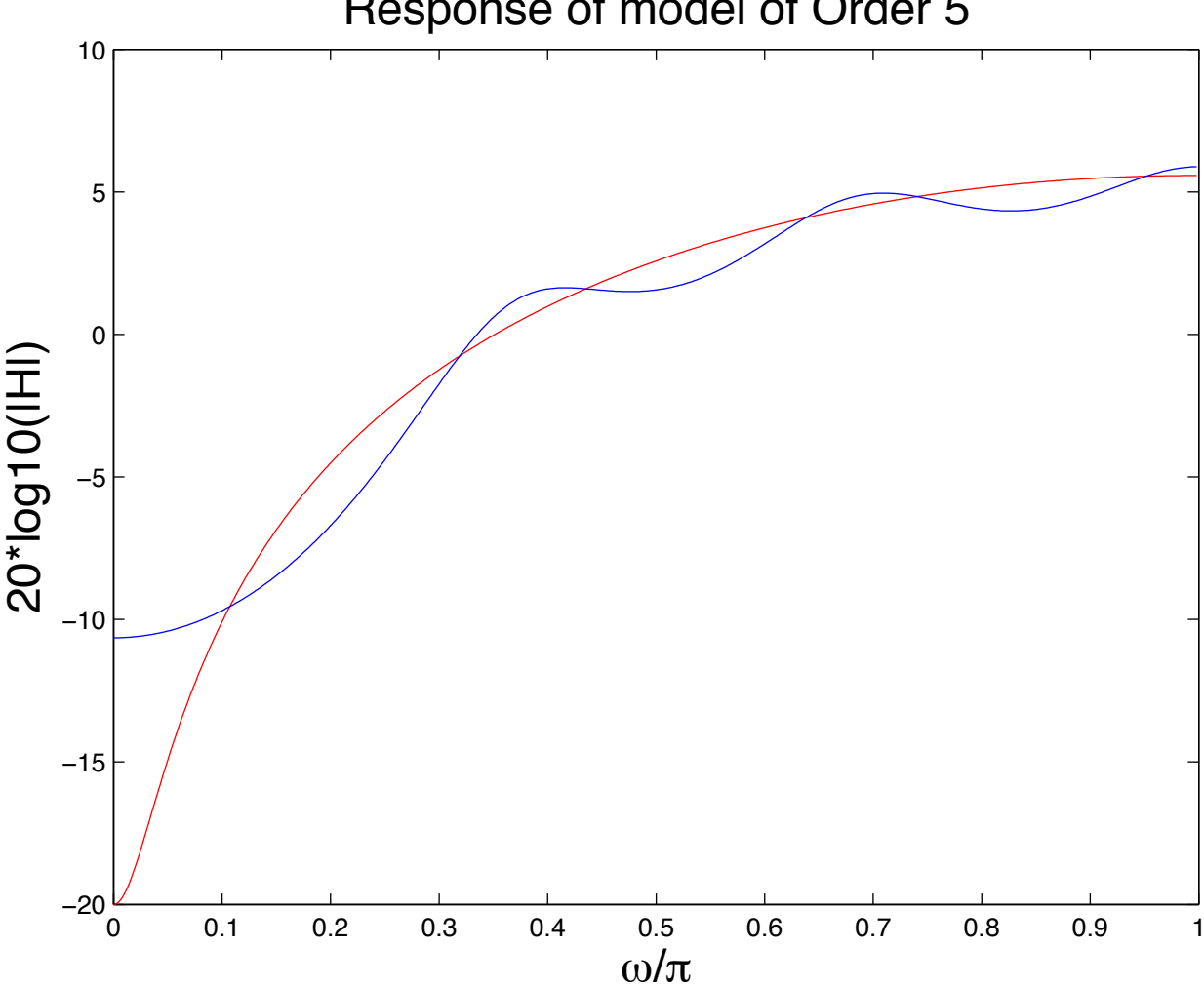

Poles of model of Order 5
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

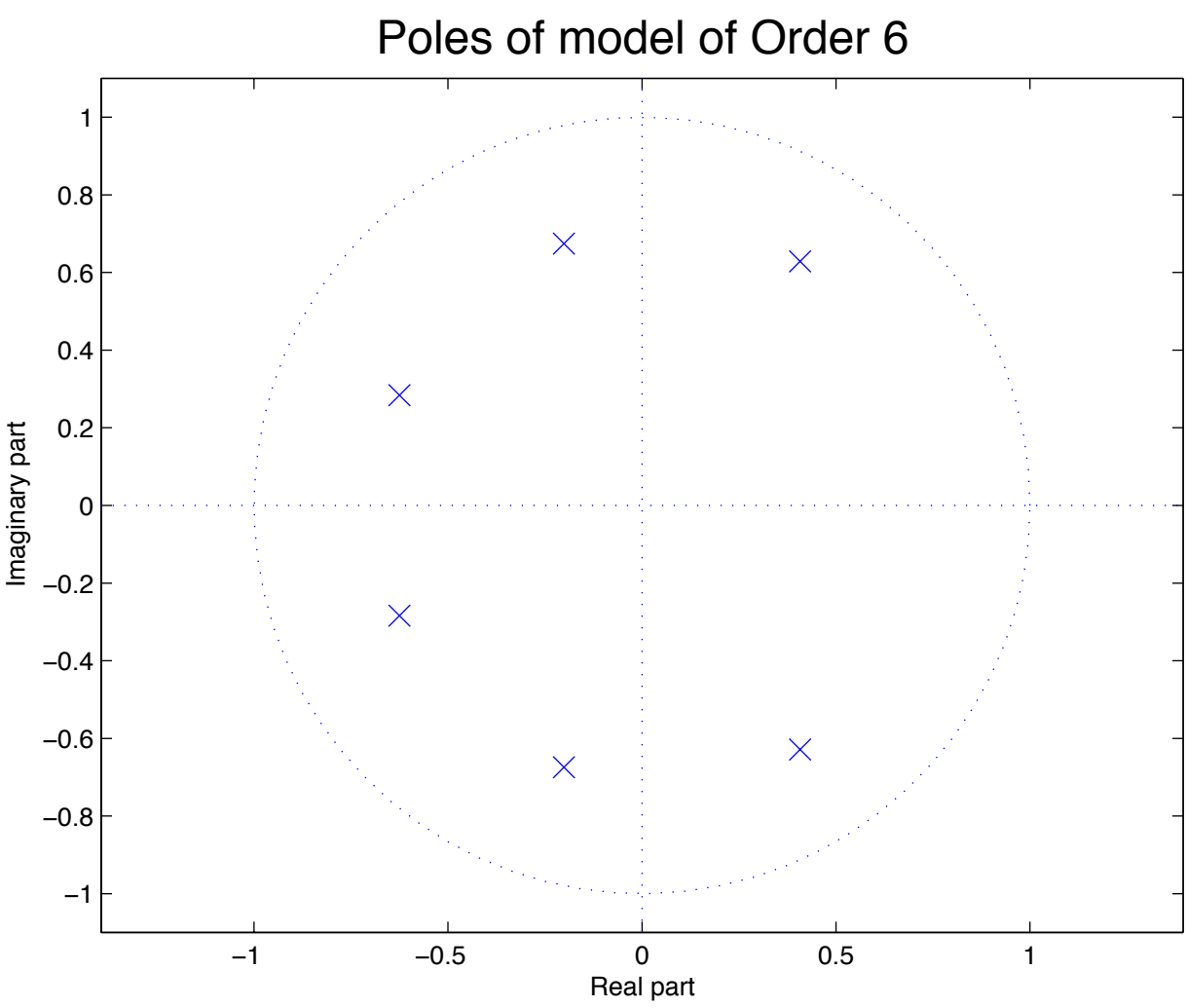

Response of model of Order 7
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

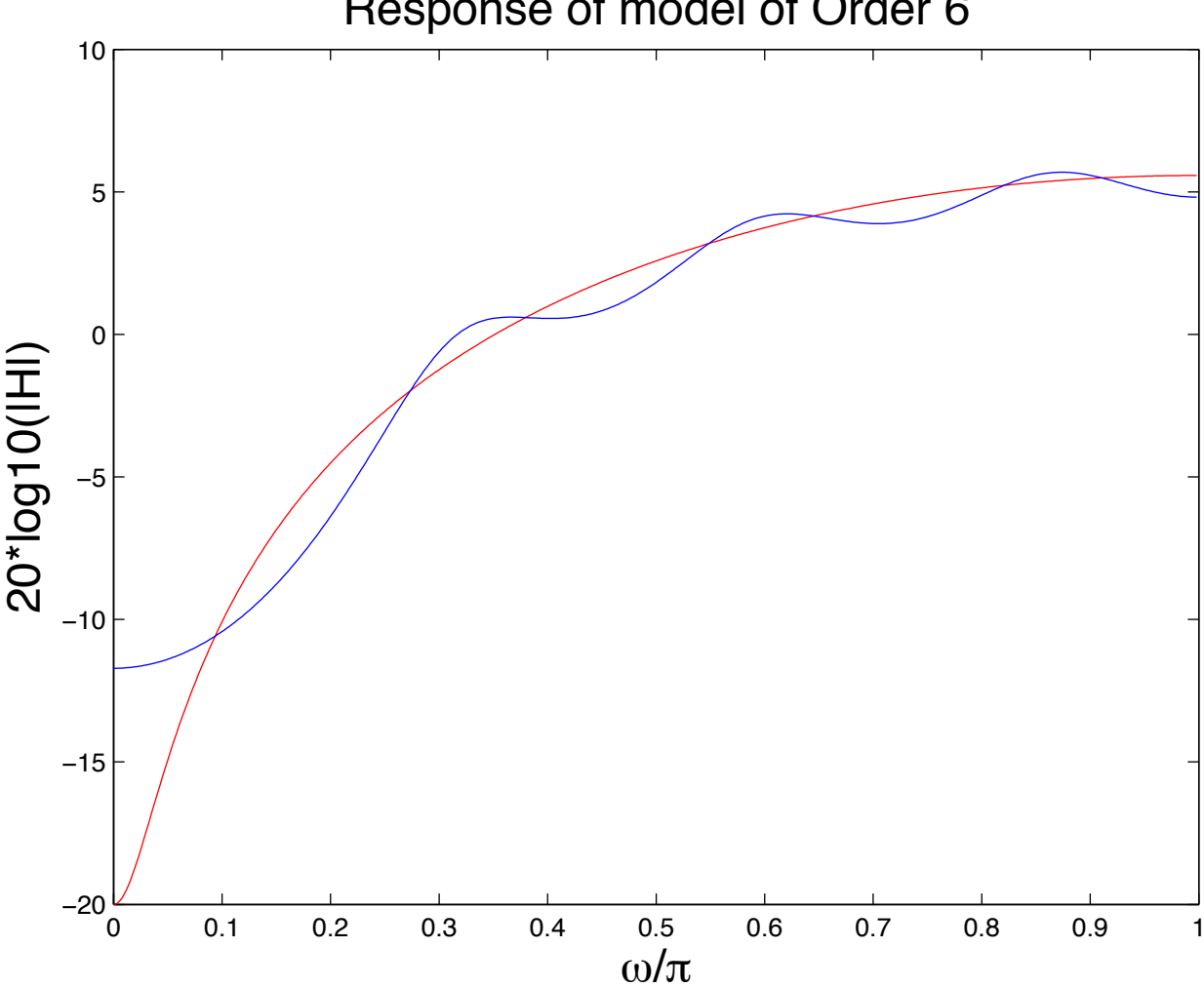

Poles of model of Order 8
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

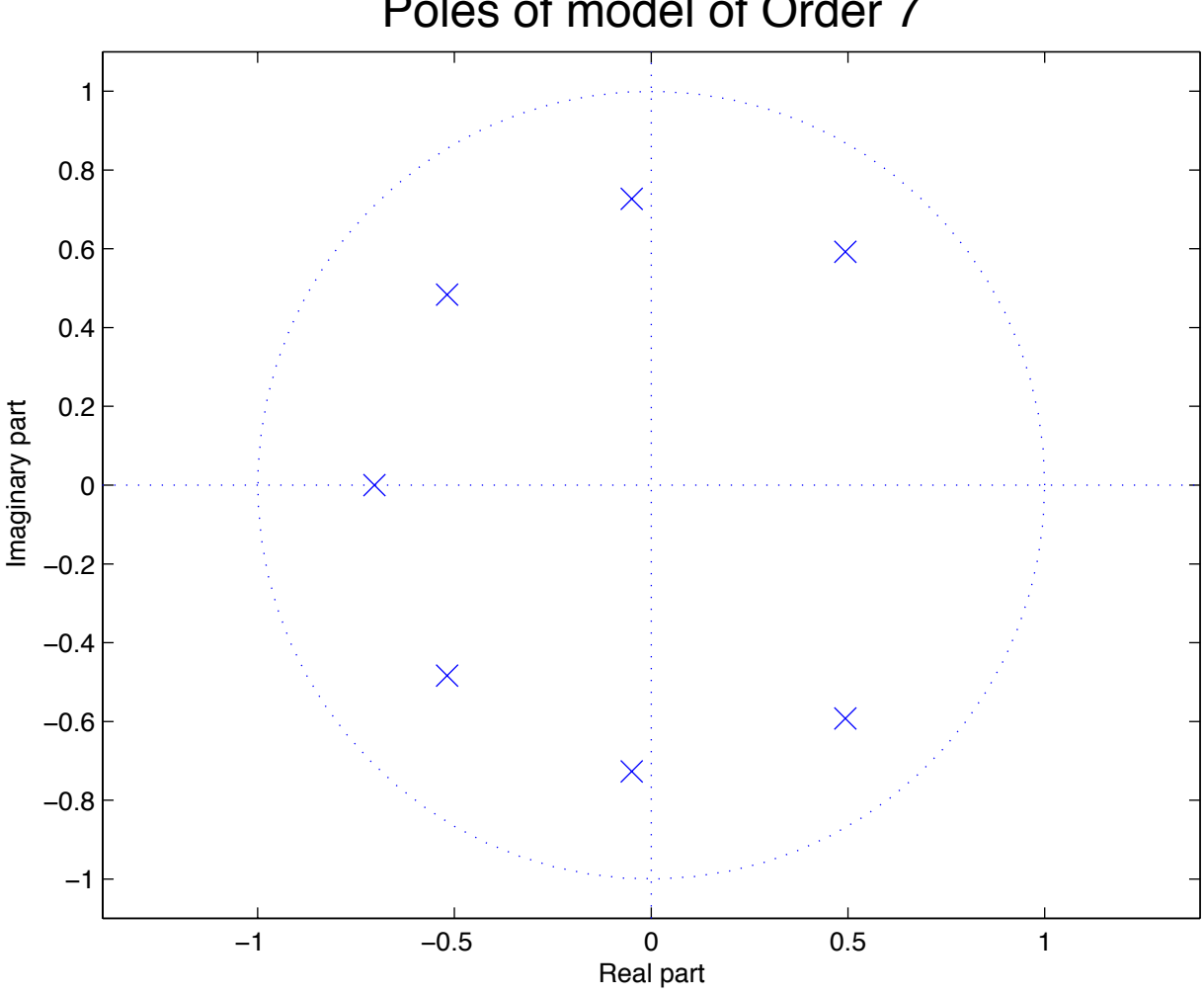

Response of model of Order 8
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

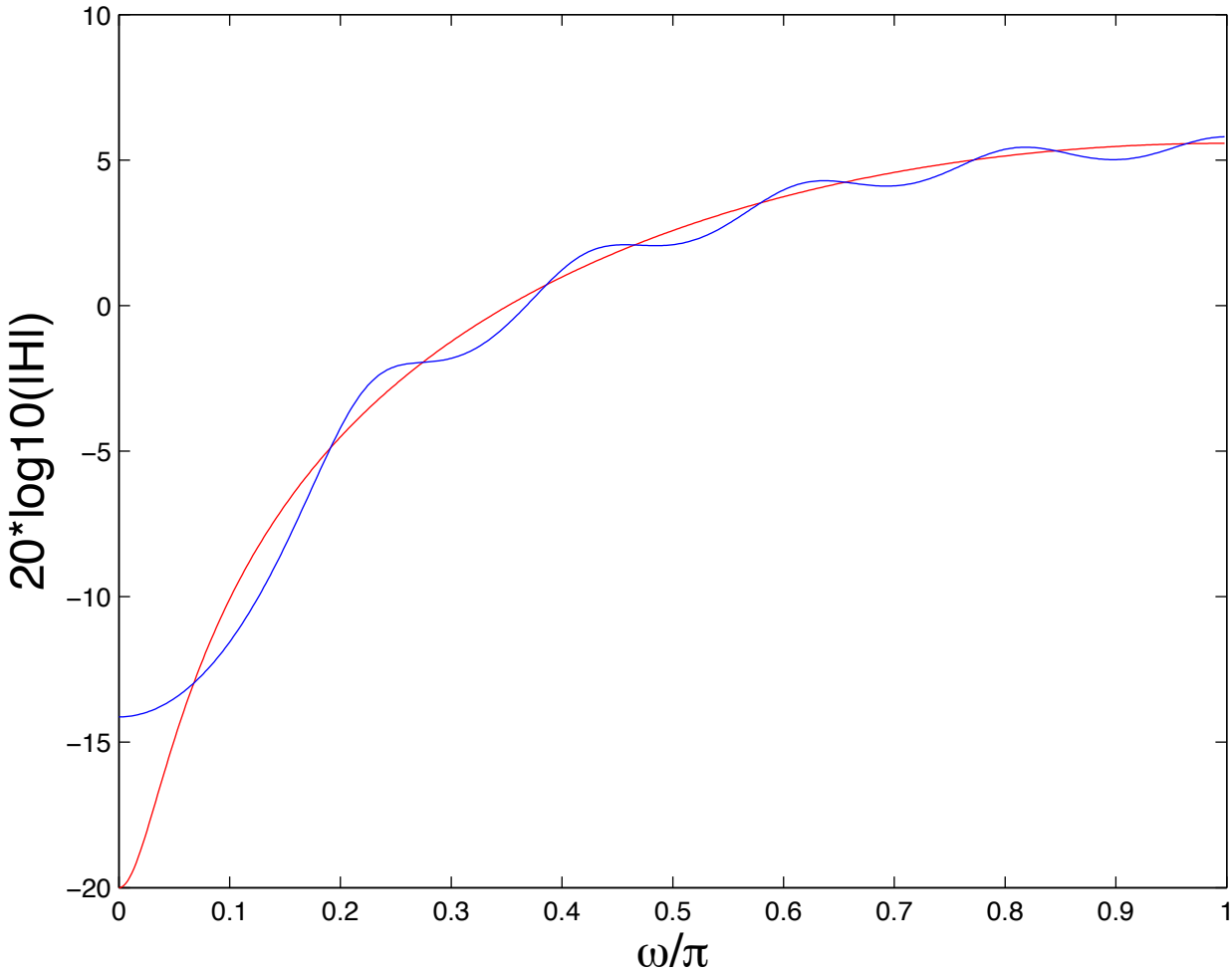

Poles of model of Order 9
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

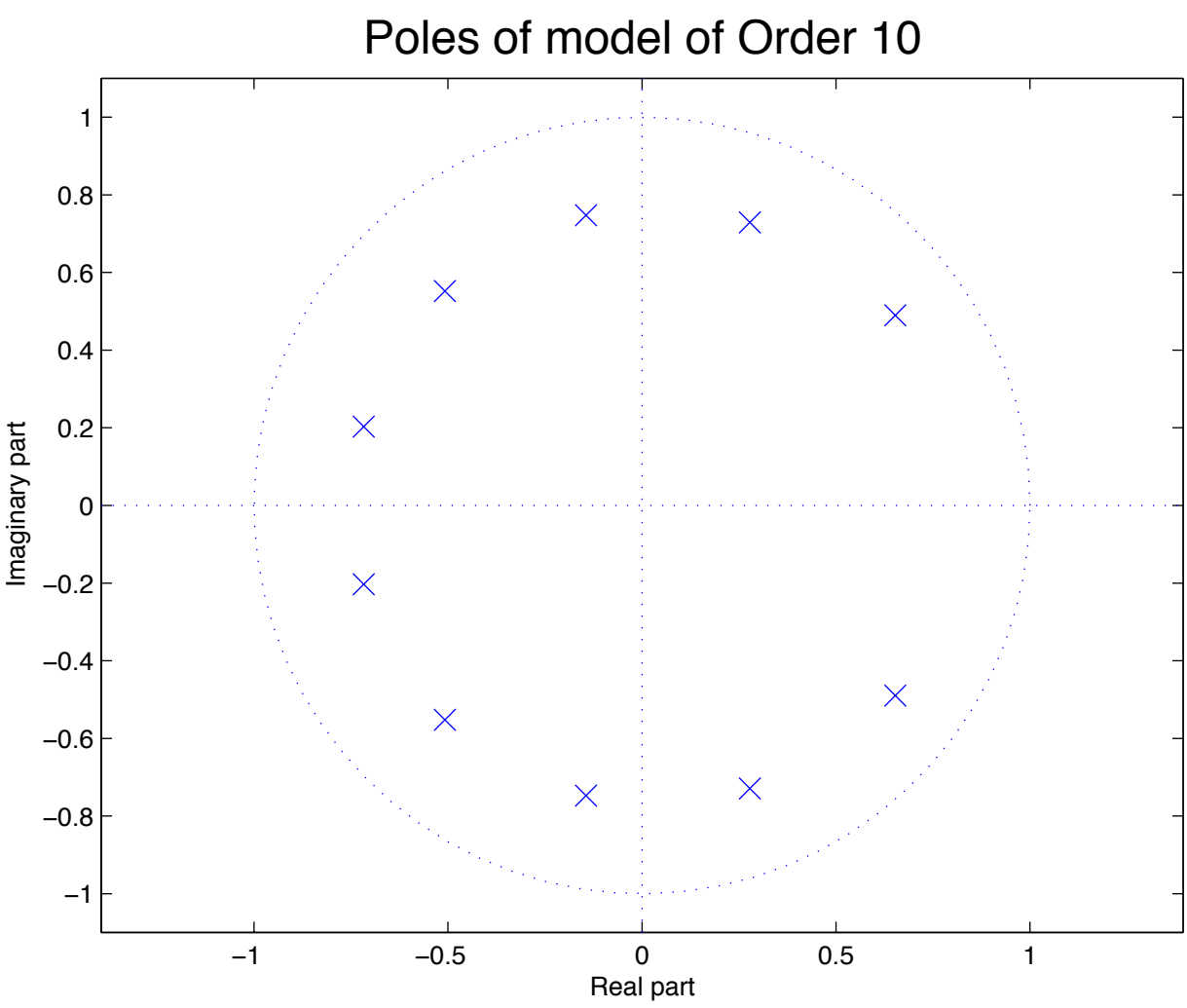

Response of model of Order 5
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

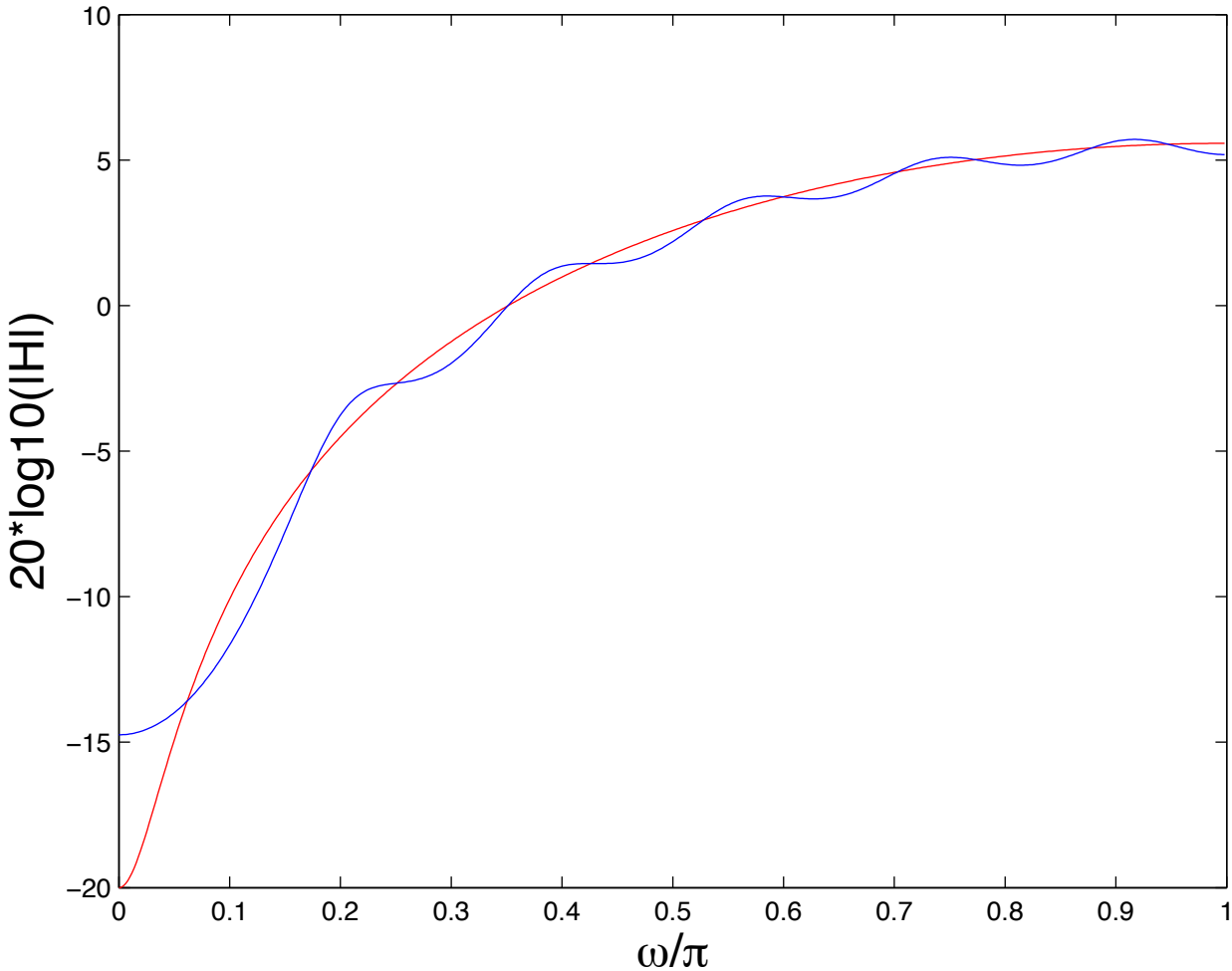

Poles of model of Order 6
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

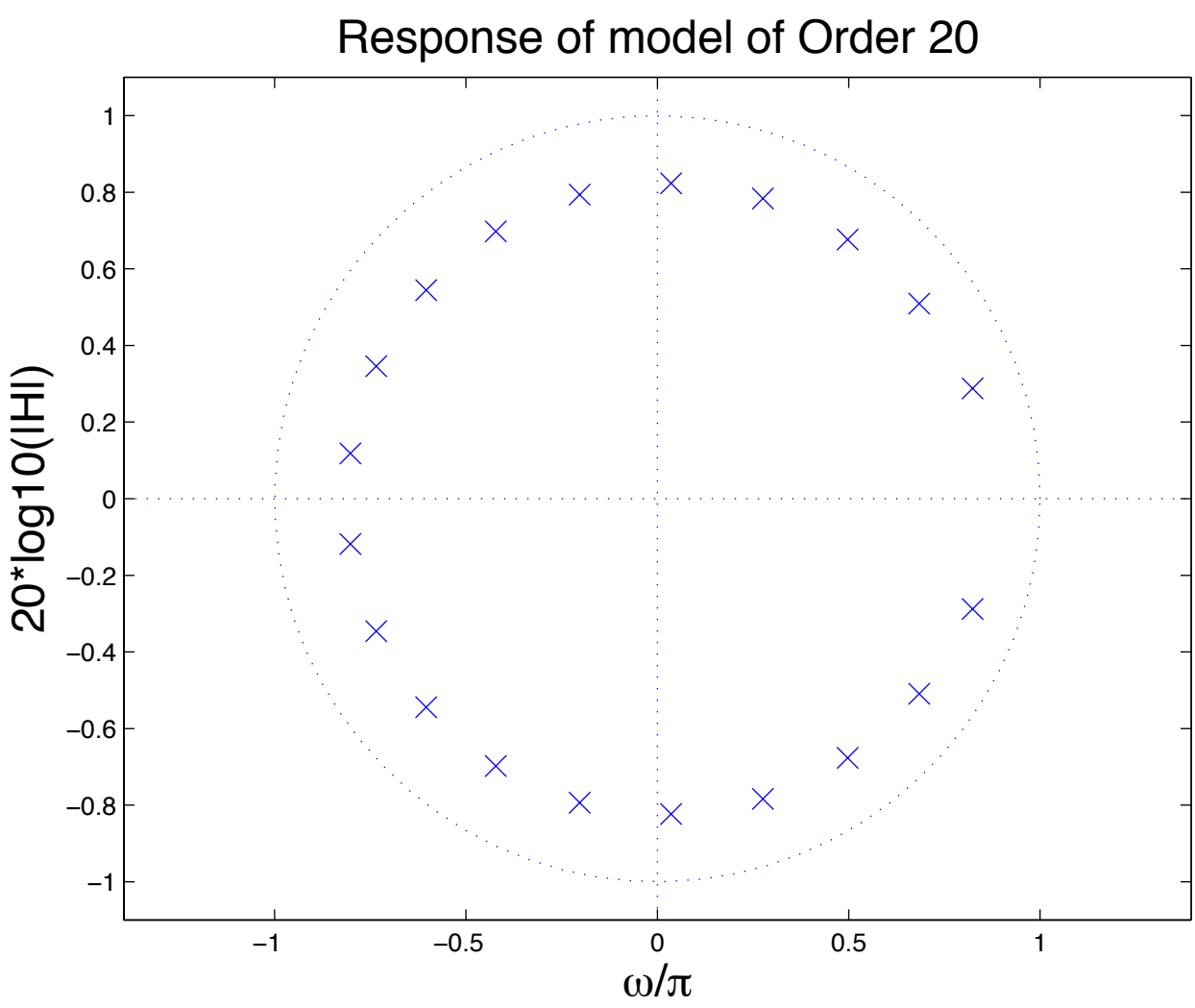

Response of model of Order 6
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

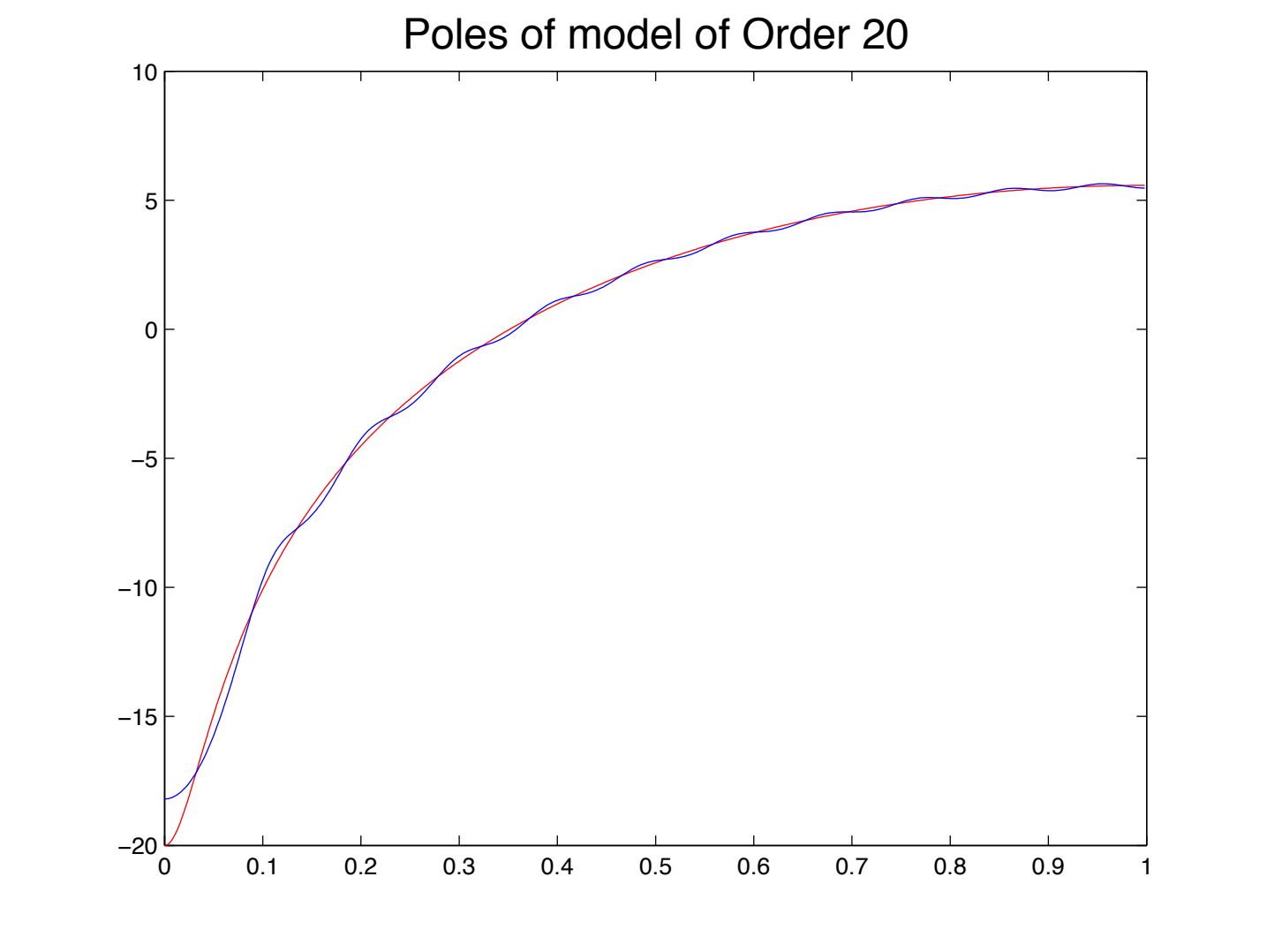

Poles of model of Order 7
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

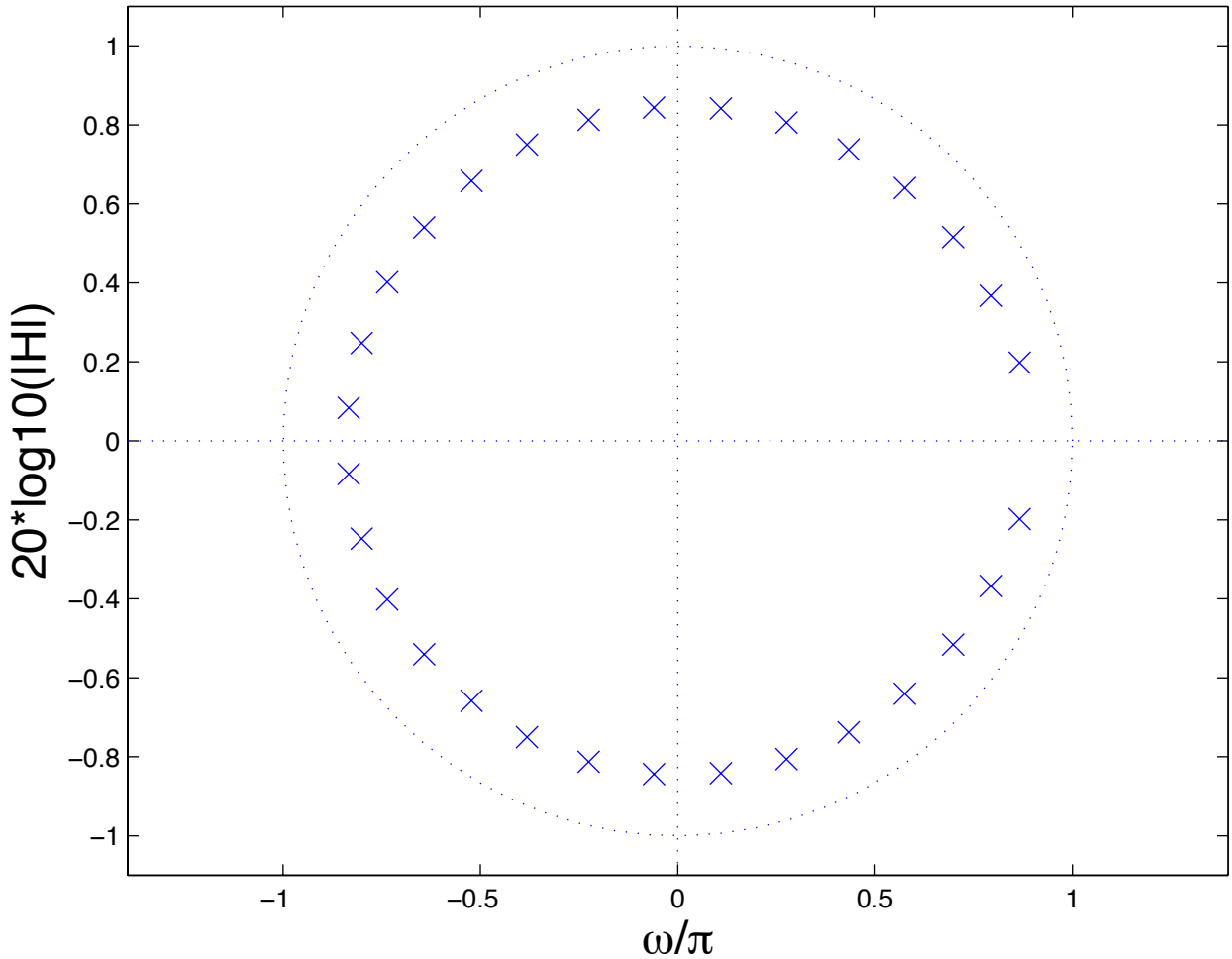

Response of model of Order 9
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

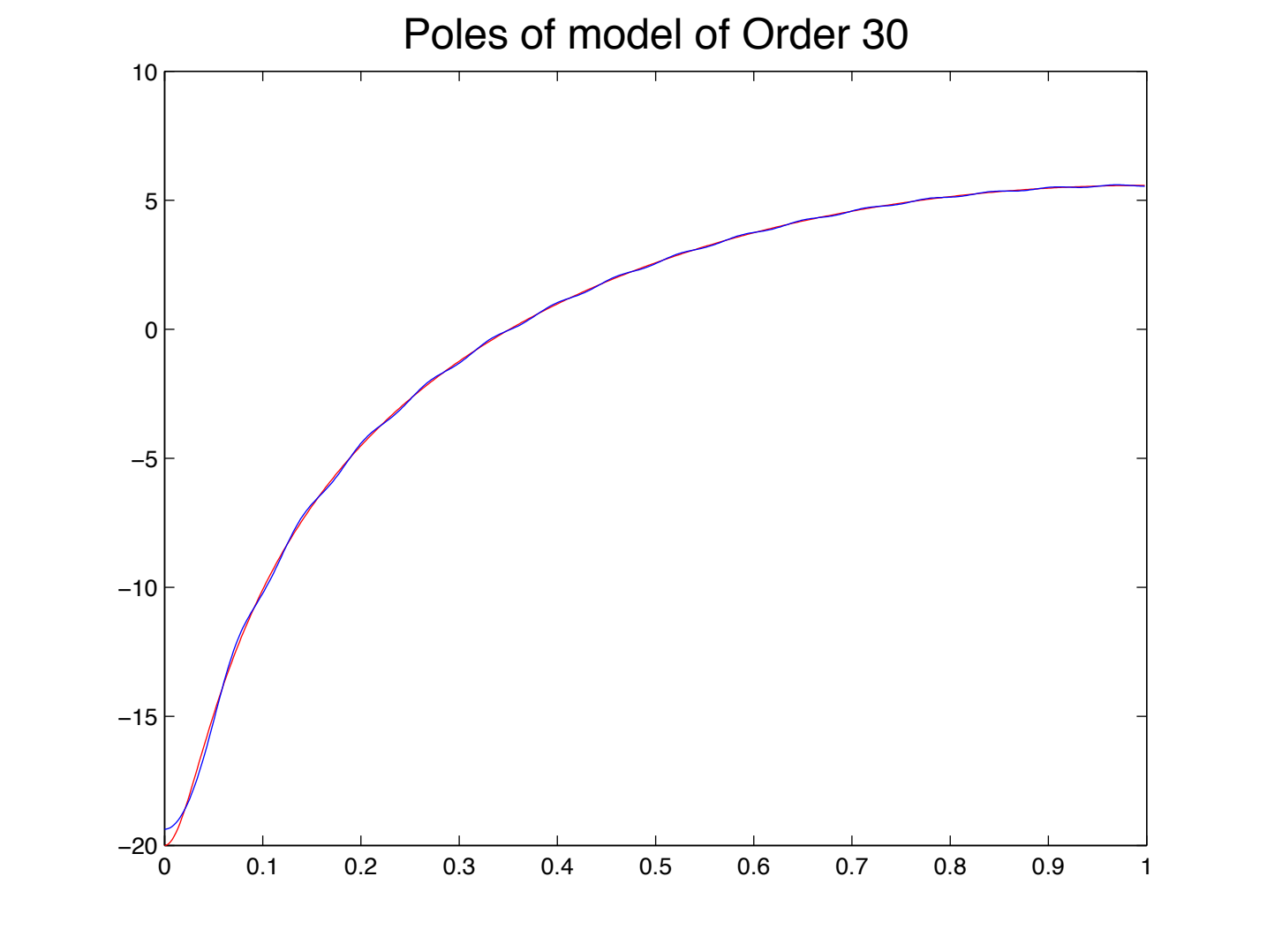

Poles of model of Order 10
Imaginary part
Real part
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

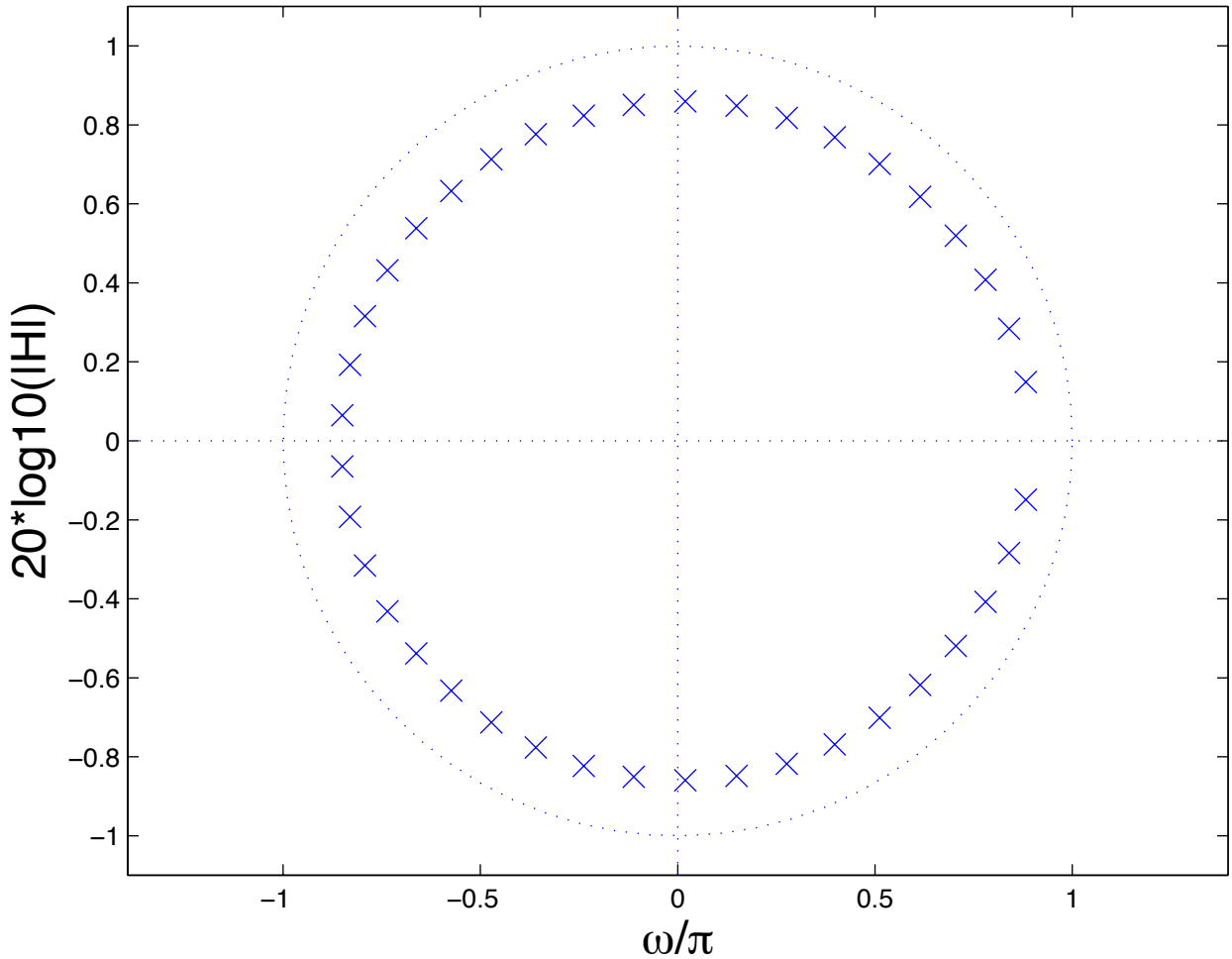

Response of model of Order 10
10
5
0
−5
−10
−15
−20
20*log10(|H|)
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
ω/π

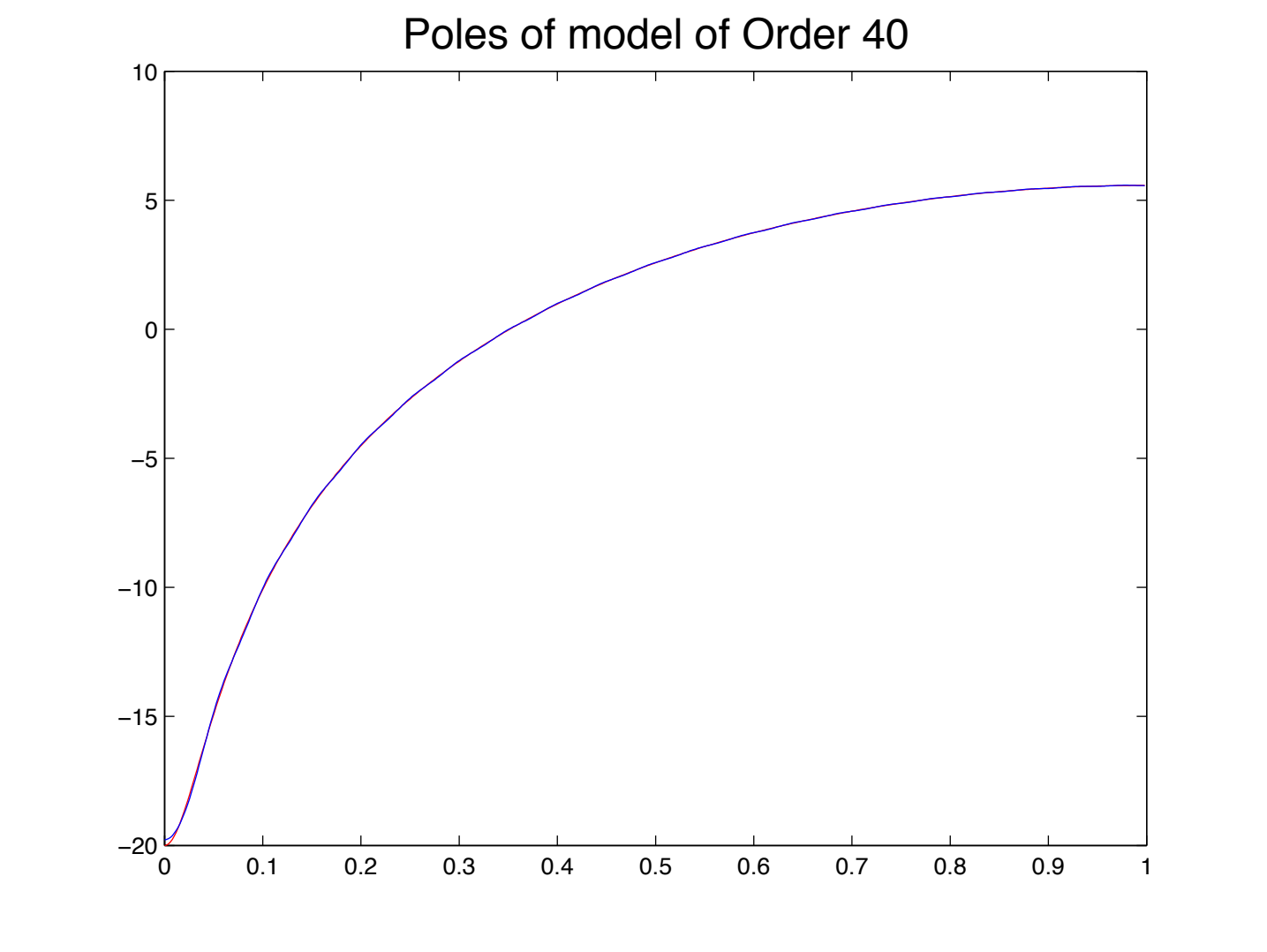

Response of model of Order 20
20*log10(|H|)
ω/π
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1

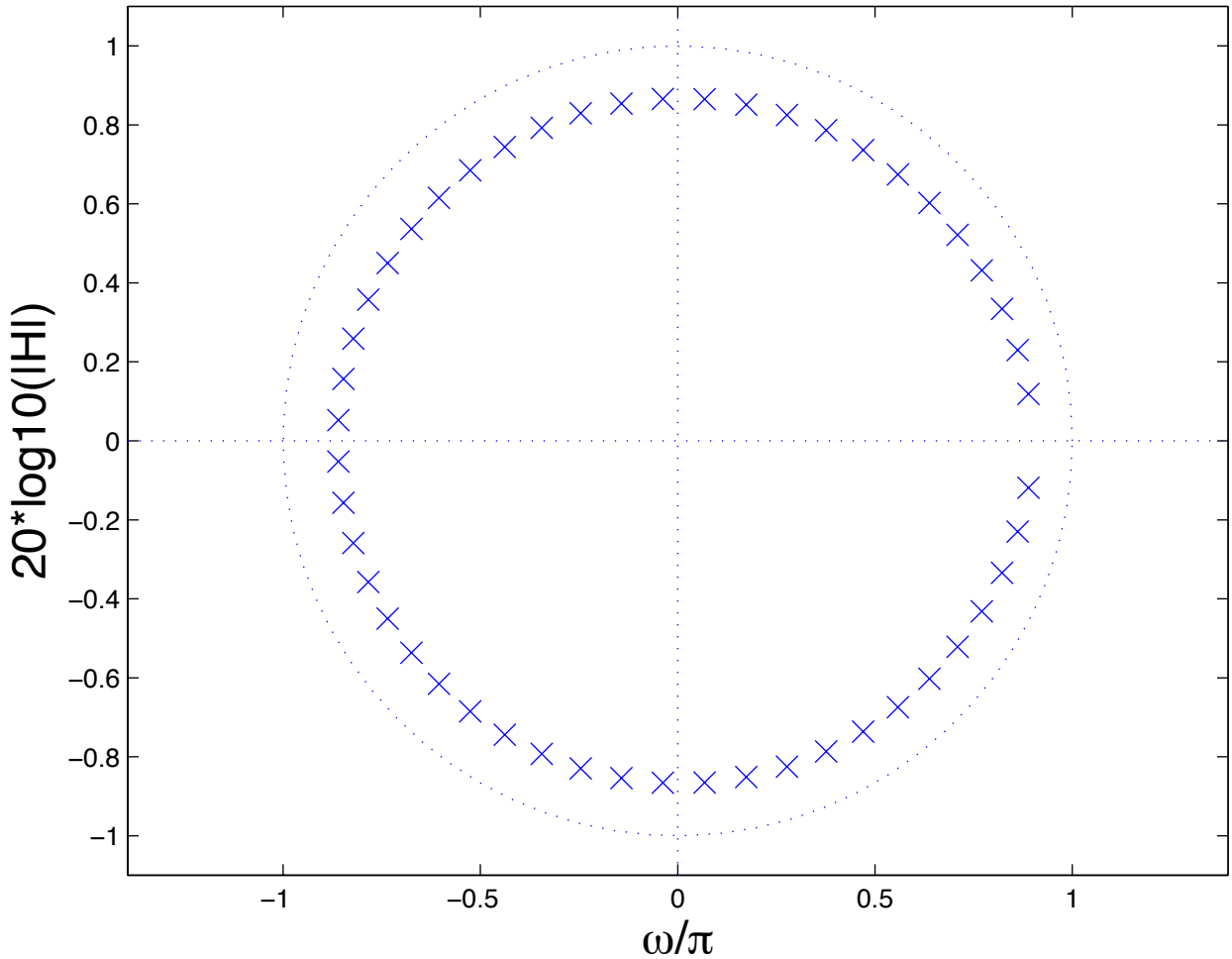

Poles of model of Order 20
10
5
0
−5
−10
−15
−20
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

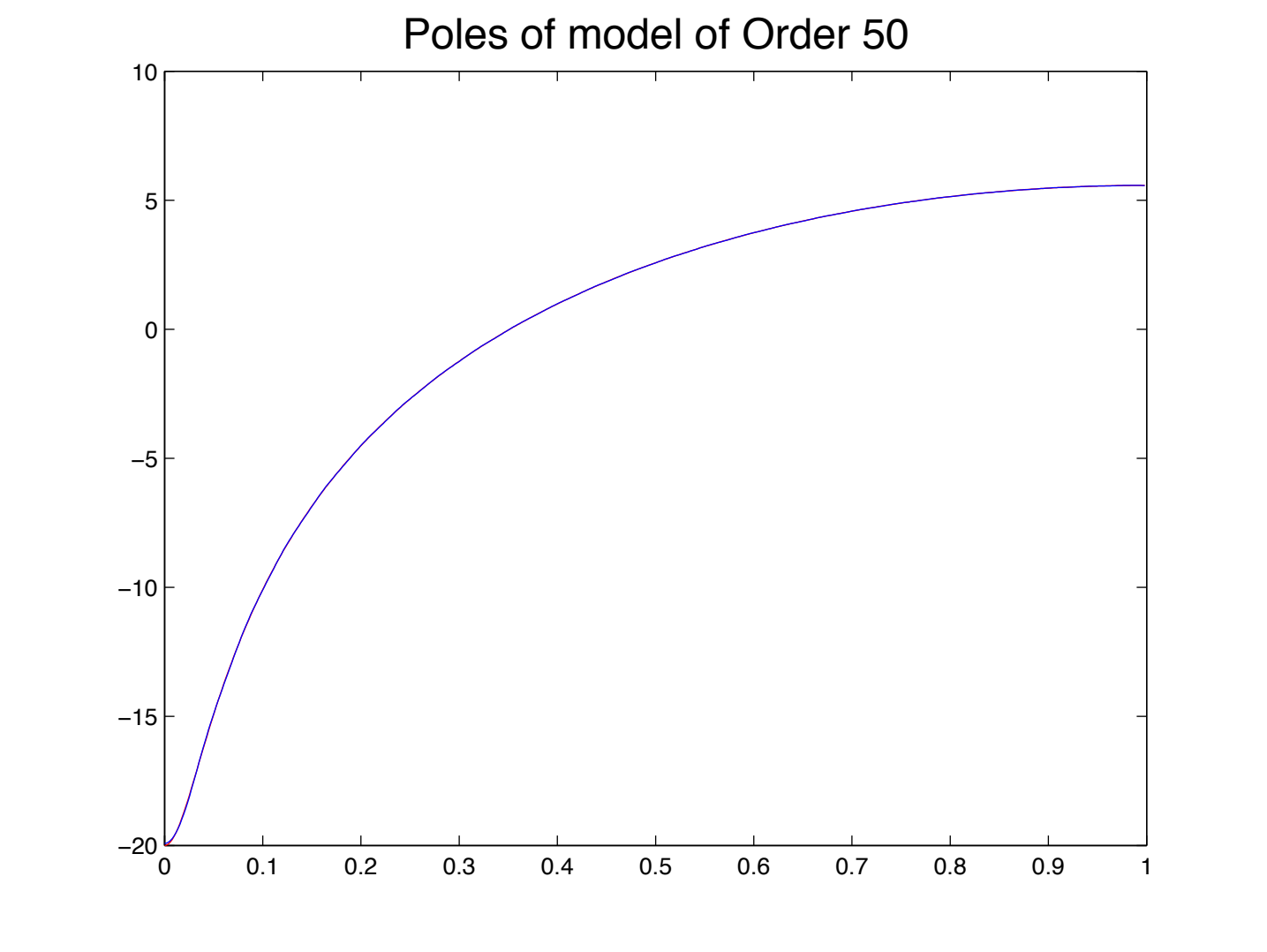

Response of model of Order 30
20*log10(|H|)
ω/π
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1


Poles of model of Order 30
10
5
0
−5
−10
−15
−20
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


Response of model of Order 40
20*log10(|H|)
ω/π
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1


Poles of model of Order 40
10
5
0
−5
−10
−15
−20
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1


Response of model of Order 50
20*log10(|H|)
ω/π
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
−0.6
−0.8
−1
−1
−0.5
0
0.5
1


Poles of model of Order 50
10
5
0
−5
−10
−15
−20
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1