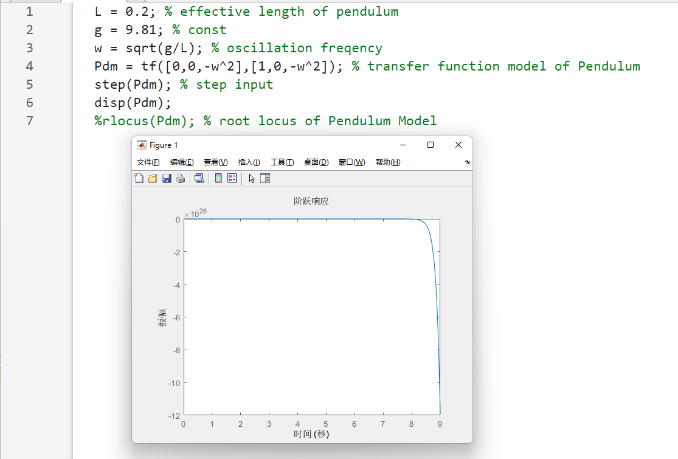
**Preparation:**

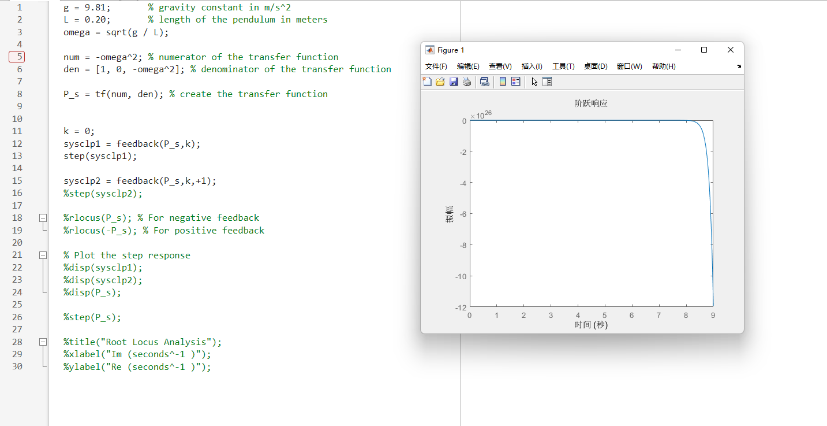
In Matlab, use the step command to plot the step response of the system.

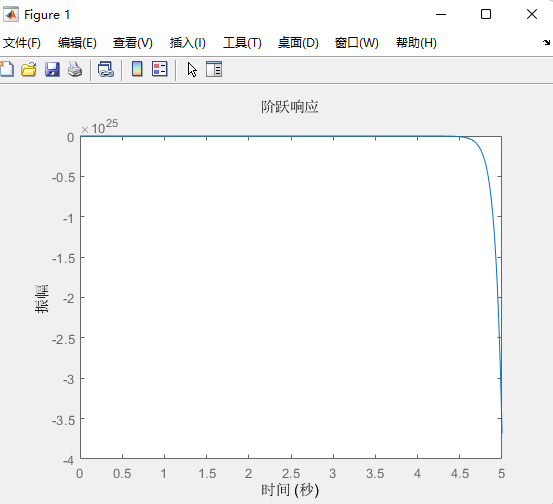
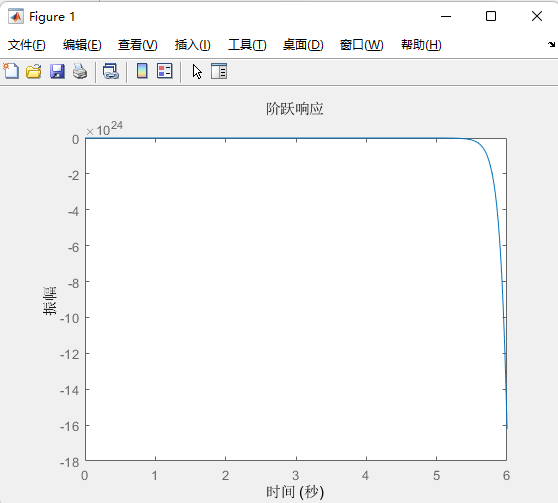


**Labwork:**

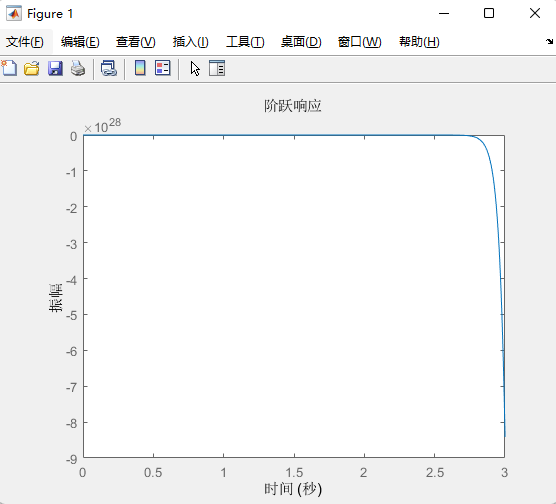
Question 5: variable pendulum under negative feedback:

K=0 k=1 k=2

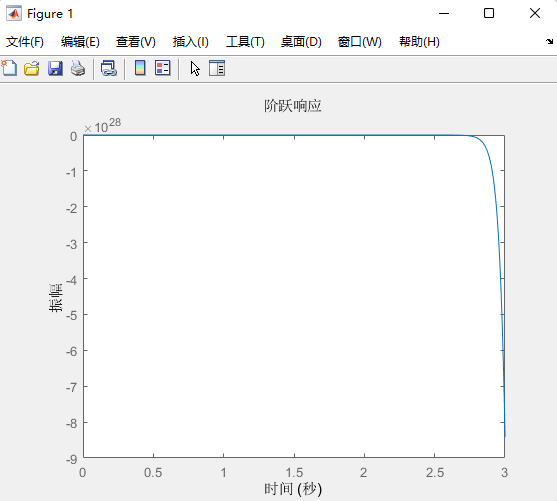


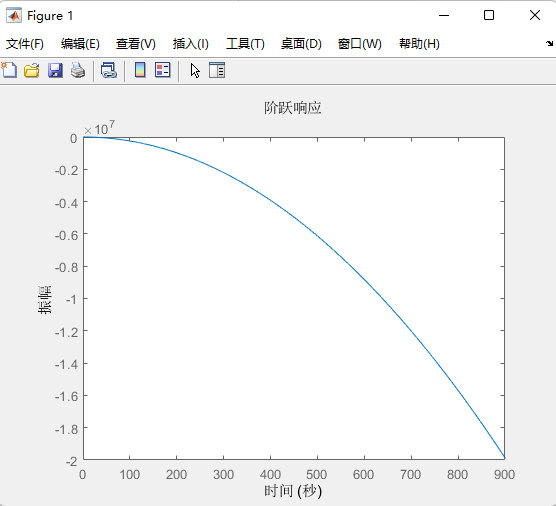
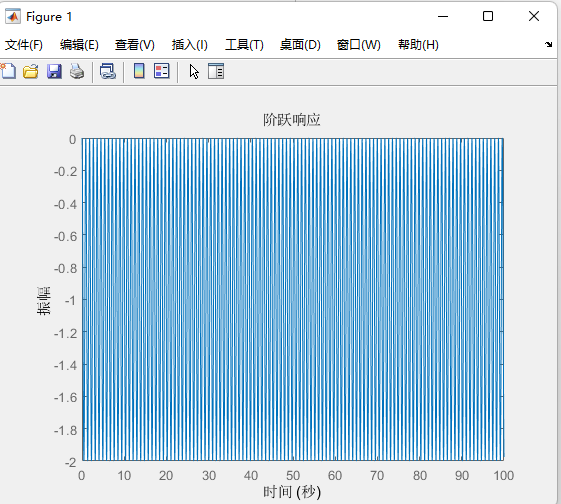
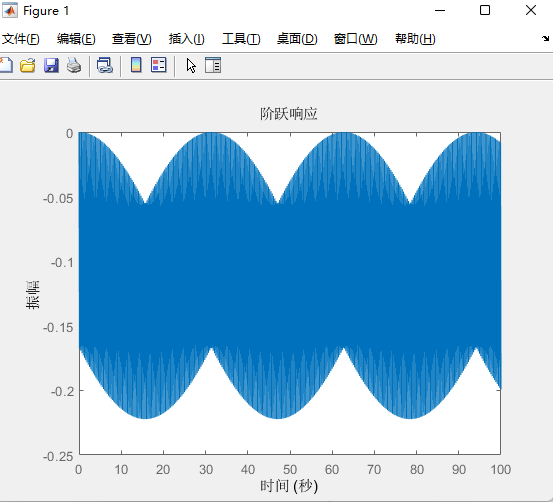


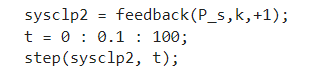
K=10



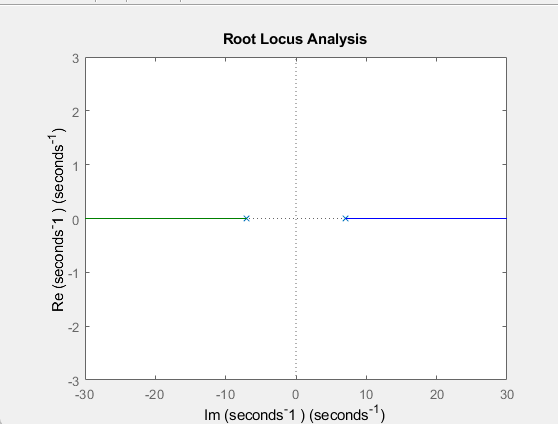
Question 6: Investigate positive feedback

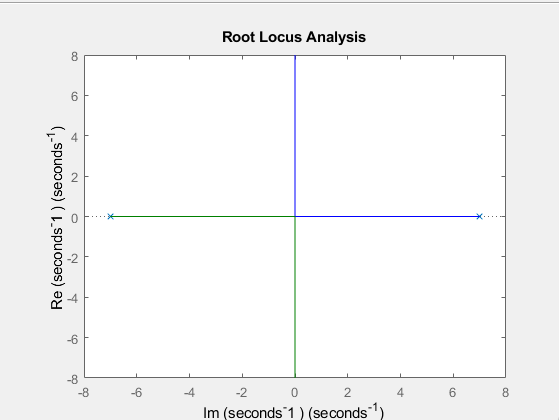
K=0 k=1 k=2 k=10



For a more readable diagram, add run time setting:

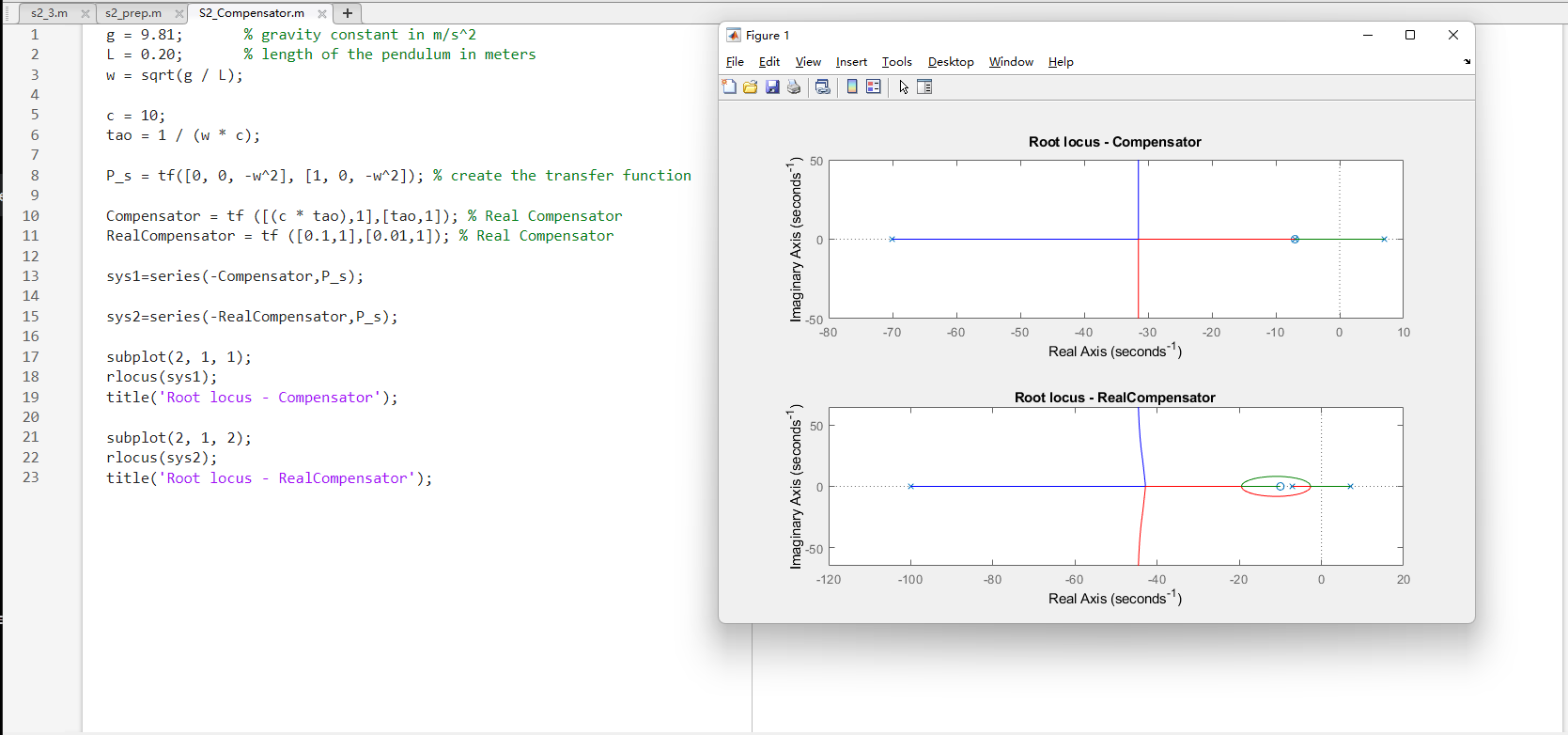
Question 7: Plot the root locus

positive feedback negative feedback



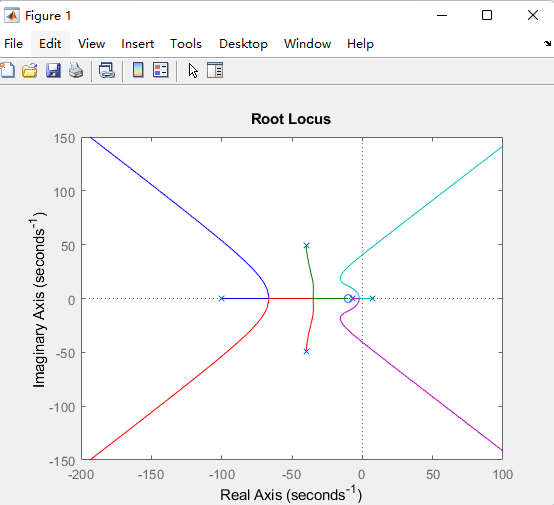
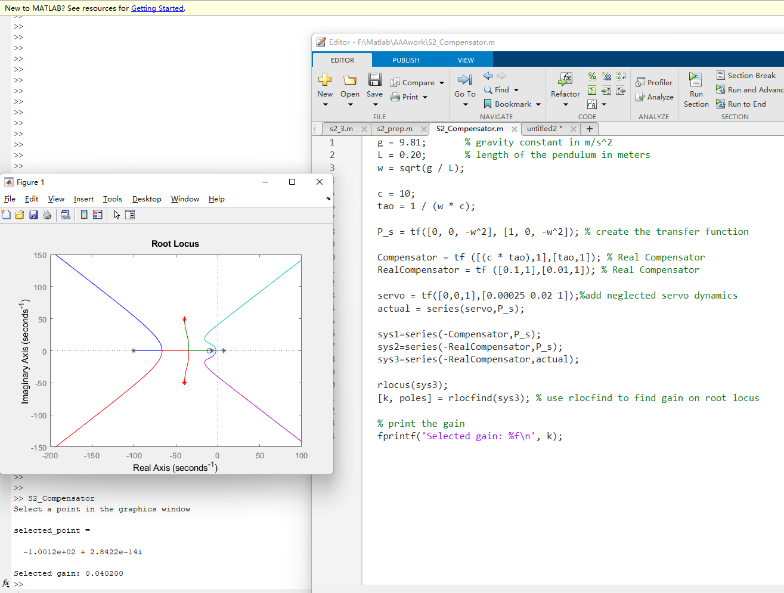
Question 8: Comment on stablilty

Question 10-11: Compensator

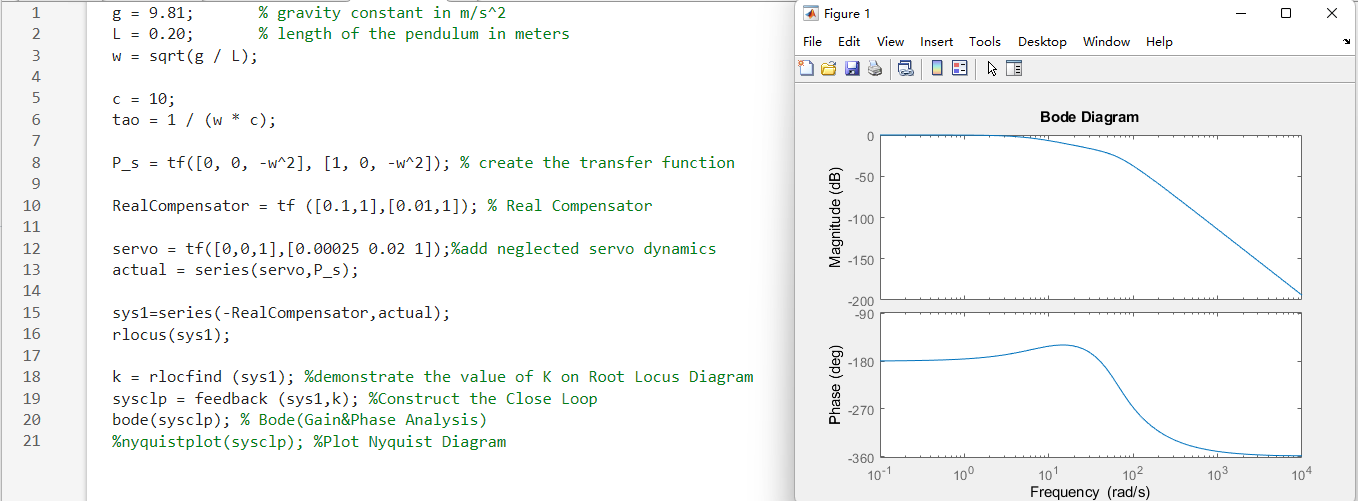


Question 13: neglected servo dynamics

Root locus: Rlocfind:



Question 14: Robustness



Nyquistplot:

