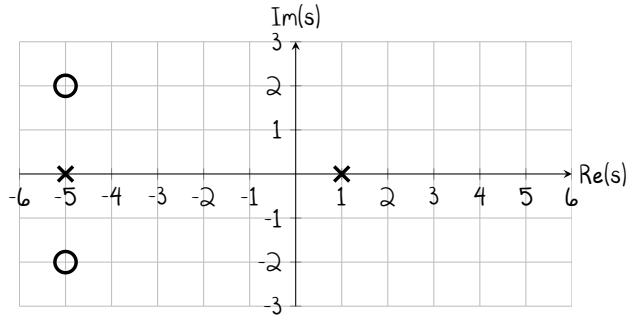
rlocus.exe Exercises for Chapter rlocus

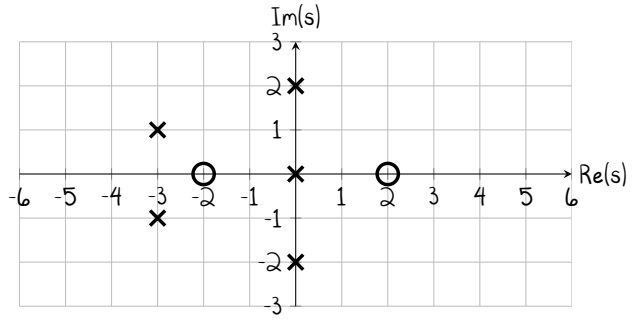
Exercise rlocus.burritosteve

Given the open-loop pole-zero plots below,
sketch the root locus plots (use this sheet)
for positive controller gain K.

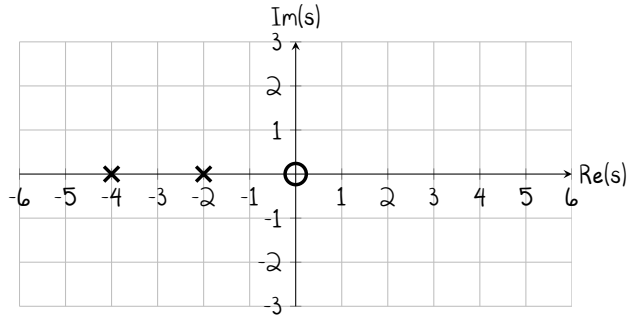
a.



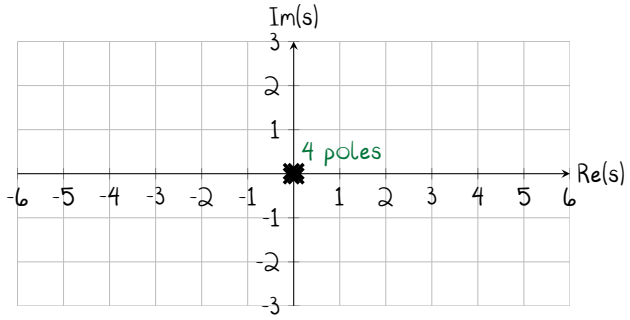
b.



c.



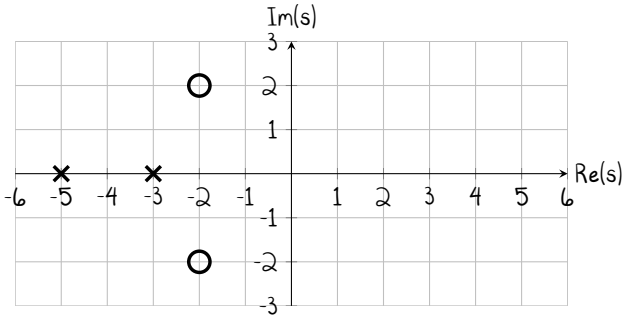
d.



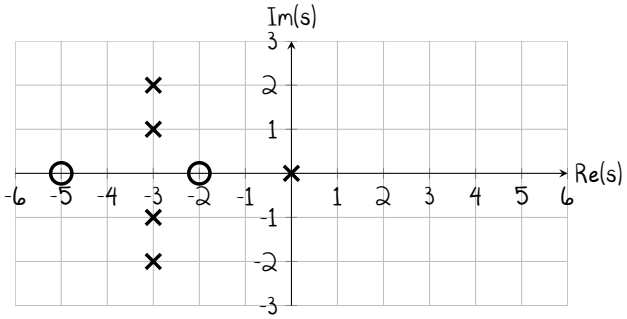
Exercise rlocus.dunnage

Given the open-loop pole-zero plots below,
sketch the root locus plots (use this sheet)
for positive controller gain K.

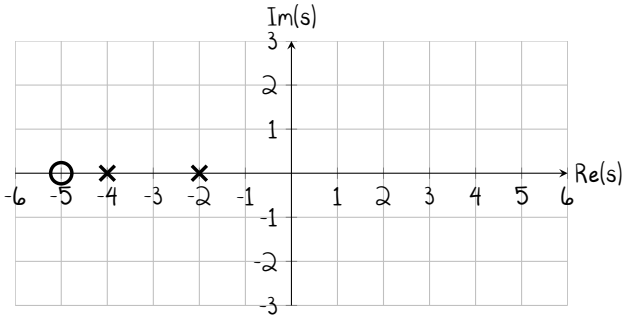
1.



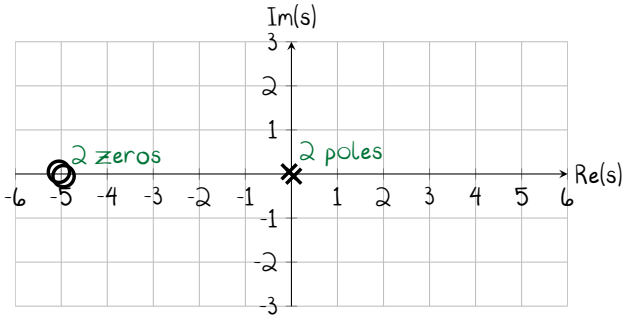
2.



3.



4.



Root-locus design

In root locus design, our task is to place the dominant closed-loop poles such that the closed-loop system

1. is stable (Chapter stab),
2. has desirable transient response performance characteristics (Chapter trans), and
3. has desirable steady-state response characteristics (Chapter steady).

Several types of controllers can be designed using these techniques. The most basic is gain control (Lec. rldesign.P), which gives us a single parameter—the loop gain—for controller design. The others we consider here are of two main types: proportional-integral-derivative (PID) and proportional-lead-lag. The two are quite similar, but the latter can be implemented with passive circuits, whereas the former require active circuits.