Effect of Lag Compensation on Root Locus
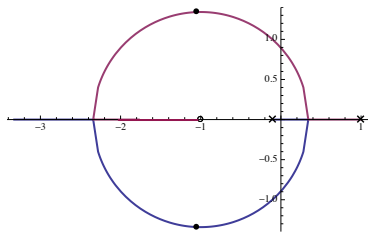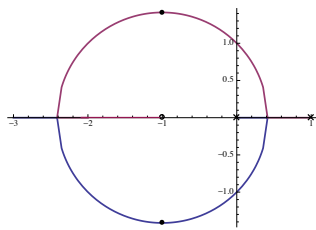
$$L(s) = \frac{s+1}{(s+p)(s-1)}$$

Intuition: By choosing p very close to zero, we can make the root locus arbitrarily close to PI root locus (stable for large enough K). Let's check:

Try $p = 0.1$

Compare to PI root locus:

What do we see? Compared to PD vs. lead, there is no qualitative change in the shape of RL, since we are not changing #(poles) or #(zeros).