```
%Tyler Matthews
%System Simulation Problem 9
clc; close all; %clear console and close figures
num = [5.269 \ 3.076 \ -0.731];
den = [1 6.81 -9 1.193];
integrator_zeros = roots(num)
integrator poles = roots(den)
%derviative of den/num = newNum/newDen
newNum = [5.267 6.15 66.138 -22.517 2.91]
newDen = [27.742 \ 32.39 \ 1.755 \ -4.49 \ 0.534]
badPoints = roots(newNum)
magnitude = abs(badPoints)
Nt=21;
Nr=12;
theta=linspace(0,2*pi,1001);
rho=linspace(0.2060,3.6076,1001);
tvec=linspace(0,2*pi,Nt);
rvec=linspace(0.2060,3.6076,Nr);
figure;
for k=1:length(rvec)
 z=rvec(k)*exp(i*theta);
 w=(z.^3 + 6.81*z.^2 - 9*z + 1.193)./(5.269*z.^2 + 3.076*z - 0.731);
 hold on
 plot(real(w), imag(w))
 hold off
end
for k=1:length(tvec)-1
 z=rho*exp(i*tvec(k));
 w=(z.^3 + 6.81*z.^2 - 9*z + 1.193)./(5.269*z.^2 + 3.076*z - 0.731);
 hold on
 plot(real(w), imag(w))
hold off
end
axis([-5 5 -10 10])
```

```
integrator_zeros =
    -0.7651
    0.1813
```

```
-7.9595
0.9996
0.1499

newNum =

5.2670 6.1500 66.1380 -22.5170 2.9100

newDen =

27.7420 32.3900 1.7550 -4.4900 0.5340

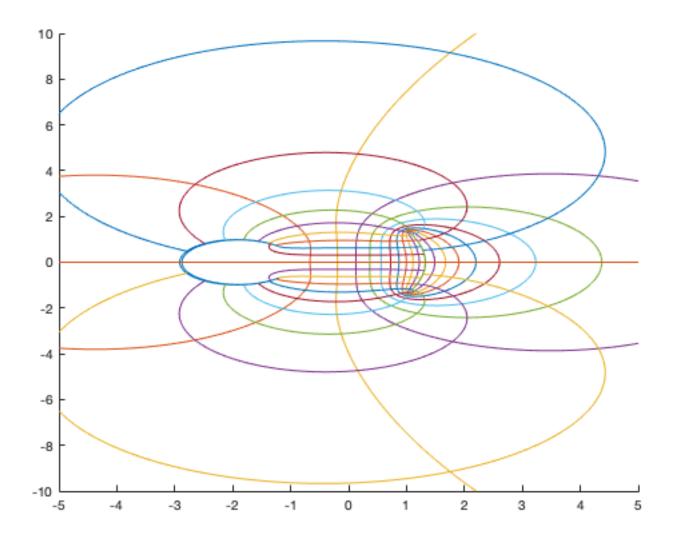
badPoints =

-0.7505 + 3.5287i
-0.7505 - 3.5287i
0.1667 + 0.1211i
0.1667 - 0.1211i
magnitude =

3.6076
```

integrator_poles =

3.6076 0.2060 0.2060



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