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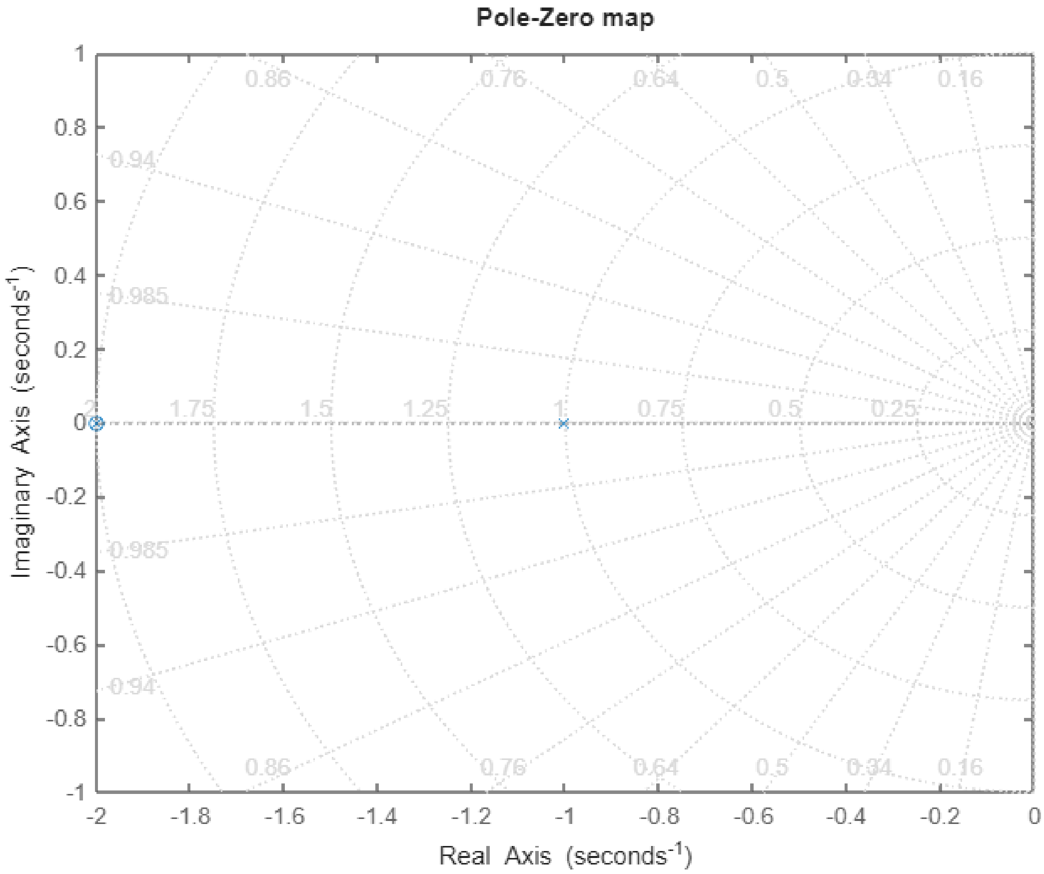
Experiment 8

Code:

```
clc;
clear all;
close all;

%Define the transfer function (numerator and denominator coefficients)

%Example: G(s) = (s+2)/(s^2+3s+2)
num = [1 2];  %Coefficients of the numerator (s+2)
den = [1 3 2];  %Coefficients of the denominator (s^2+3s+2)

%create the transfer function using MATLAB's tf function
sys = tf(num,den);

%Determine poles and zeros
poles = pole(sys);
zeros = zero(sys);

%Display the poles and zeros
disp('Poles of the system')
disp(poles)

disp('zeros of the system')
disp(zeros)

%plot the poles and zeros on the s-plane
figure;
pzmap(sys);    %Pole-zero map
grid on;
title('Pole-Zero map');

%Determine system stability
if all(real(poles)<0)
   disp('The system is stable becuase all poles are in the left half of the s-plane');
elseif any(real(poles)>0)
   disp('the system is unstable because at least one pole is in the right half of the s-plane. ');
elseif any(real(poles)==0)
   disp('The system is marginally stable because at least one point lies on the imaginary axis.');
end
```




```
Poles of the system
    -2
    -1

zeros of the system
    -2

The system is stable becuase all poles are in the left half of the s-plane
>>
```

Conclusion: We have successfully determined the location of poles and zeros and determining its role to find stability.