Homework 

clc;

clear all; close all;

start=1;

x0 = [start;0]; % x0 is the intial state of the system

tspan=[0; 10]; % simulation time

[t,x] = ode45(@sys\_dynamics,tspan,x0);

n=size(t,1);

line0=zeros(n,1);

SettlingTime=0;

for i=1:n

if abs(x(i,1))>start\*0.05

SettlingTime=t(i);

end

end

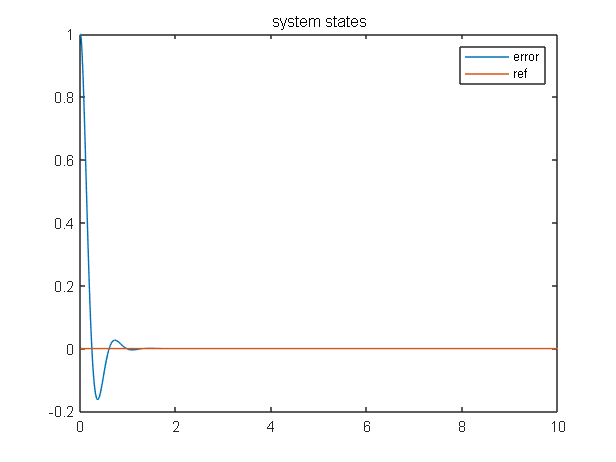
SettlingTime

SettlingTime = 0.5249

% overshoot=abs(overshoot/start\*100)

% plot the simulation data

figure; plot(t,x(:,1),t,line0); legend('error','ref'); title('system states');



function dx=sys\_dynamics(t,x)

kp=100;

dx=zeros(2,1);

dx(1)=x(2);

dx(2)=-10\*x(2)-kp\*x(1);

end