%steady state error

clc

clear all

% Type ZERO System

Gp0 = zpk([-2 -3],[-8 -9 -12],100)

Kp0 = dcgain(Gp0)

ssr\_steps0 = 1/(1+Kp0)

Gv0 = zpk([0 -2 -3],[-8 -9 -12],100)

Kv0 = dcgain(Gv0)

ssr\_ramp0 = 1/Kv0

Ga0 = zpk([0 0 -2 -3],[-8 -9 -12],100)

Ka0 = dcgain(Ga0)

ssr\_parabolic0 = 1/Ka0

% Type ONE System

Gp1 = zpk([-2-3],[0-8-9-12],100)

Kp1 = dcgain(Gp1)

ssr\_steps1 = 1/(1+Kp1)

Gv1 = zpk([0 -2 -3],[0 -8 -9 -12],100)

Kv1 = dcgain(Gv1)

ssr\_ramp1 = 1/Kv1

Ga1 = zpk([0 0 -2 -3],[0 -8 -9 -12],100)

Ka1 = dcgain(Ga1)

ssr\_parabolic1 = 1/Ka1

% Type TWO System

Gp2 = zpk([ -2-3],[0 0-8-9-12],100)

Kp2 = dcgain(Gp2)

ssr\_steps2 = 1/(1+Kp2)

Gv2 = zpk([0-2-3],[0 0-8-9-12],100)

Kv2 = dcgain(Gv2)

ssr\_ramp2 = 1/Kv2

Ga2 = zpk([0 0-2-3],[0 0-8-9-12],100)

Ka2 = dcgain(Ga2)

ssr\_parabolic2 = 1/Ka2

%PLOT RESPONSES

G0=zpk( [ -2 -3], [ -8 -9 -12], 100)

G1=zpk( [-2 -3], [0 -8 -9 -12], 100)

G2=zpk( [ -2-3], [0 0-8-9 -12], 100)

%Figure

%%

% Type 0 system

sys0=feedback(tf(G0),1) ;

% step input

subplot (3, 3, 1) ;

t=0.0001:0.01:5;

u=t./t;

lsim(sys0,u,t);

% Ramp input

subplot(3,3,2);

t=0.0001:0.01:5;

u=t;

u(1:100)=0;

lsim(sys0,u,t);

% acceleration input

subplot(3,3,3);

t=0.0001:0.01:5;

u=t.\*t/2;

u(1:100)=0;

lsim(sys0,u,t);

%%

% Type 1 system

sys1=feedback(tf(G1),1);

% step input

subplot(3,3,4);

t=0.0001:0.01:5;

u=t./t;u(1:100)=0;

lsim(sys1,u,t);

% Ramp input

subplot(3,3,5);

t=0.0001:0.01:5;

u=t;

lsim(sys1,u,t);

% acceleration input

subplot(3,3,6);

t=0.0001:0.01:5;

u=t.\*t/2;

lsim(sys1,u,t);

%%

% Type 2 system

sys2=feedback(tf(G2),1);

% step input

subplot(3,3,7);

t=0.0001:0.01:5;

u=t./t;

u(1:100)=0;

lsim(sys2,u,t);

% Ramp input

subplot(3,3,8);

t=0.0001:0.01:5;

u=t;

u(1:100)=0;

lsim(sys2,u,t);

% acceleration input

subplot(3,3,9);

t=0.0001:0.01:5;

u=t.\*t/2;

lsim(sys2, u,t)



