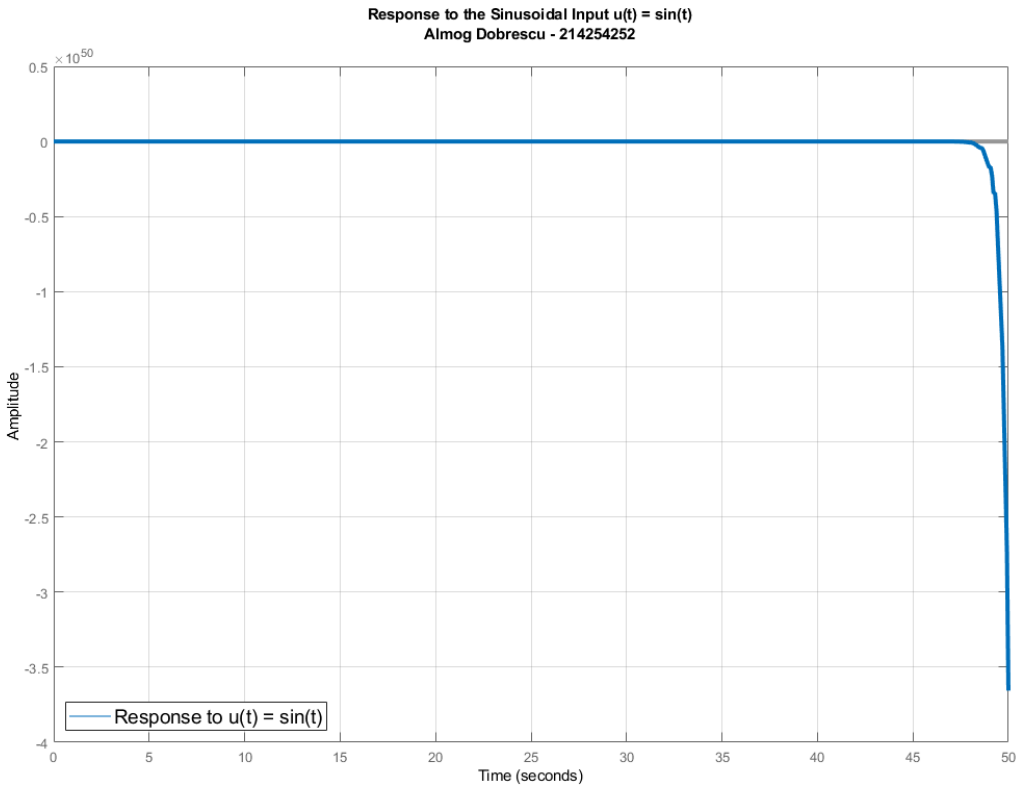
```
%Almog Dobrescu
clc;

A = [3 0 0 0 -16;
    1/3 -4/3 -1/3 -1/3 -2/3;
    16/3 -4/3 -7/3 5/3 -32/3;
    -2/3 2/3 2/3 -10/3 4/3;
    0 0 0 0 -5];

B = [1;2;-4;3;0];

C = [-4 2 4 -3 7];

D = [0];

X0 = [1;0;1;0;0];

%Q2.1

poly(A)

%Q2.2

eig(A)

%Q2.3

[z, p, k] = ss2zp(A,B,C,D)

%Q2.5

sys = ss(A,B,C,D);
[u,t] = gensig("sine",5,50);
fig1 = figure("Name",'Response to the Sinusoidal Input u(t) =
 sin(t)','Position',[200 50 1200 820]);
lsim(sys,u,t,X0);
set(findall(gcf, 'type', 'line'), "linewidth", 3)
title (["Response to the Sinusoidal Input u(t) = sin(t)", "Almog Dobrescu -
 214254252"])
grid on
grid minor
legend({'Response to u(t) = sin(t)'},'FontSize',14 ,'Location','southwest')
%exportgraphics(fig1, 'Q2_5-graph.png','Resolution',1200); %export the fig to
 a png file


ans =

    1.0000    9.0000   13.0000  -69.0000 -194.0000 -120.0000


ans =
```

```
   -4.0000
   -2.0000
   -1.0000
    3.0000
   -5.0000


z =

    3.0000
   -1.4800
   -2.0000
   -5.0000


p =

   -4.0000
   -2.0000
   -1.0000
    3.0000
   -5.0000


k =

  -25.0000
```



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