%problem 1

disp("problem 1");

disp("x=s^2 + 4s +3");

disp("h=s+5");

disp("s^3 + 4s^2 + 3s + 5s^2 + 20s + 15");

disp("s^3 + 9s^2 + 23s + 15");

disp('Press any key to continue...');

pause;

%problem 2

disp("problem 2");

q = [2 4];

v = [5 3];

w = conv(q,v);

disp('Press any key to continue...');

pause;

%problem 3

disp("problem 3");

x = [1 4 3];

h = [1 5];

i = conv(x,h);

disp('Press any key to continue...');

pause;

%problem 4

disp("problem 4");

%setup the time scale step

T = 10^-8;

t2 = 0:T:10^-5;

%building the function

%NOTE: exp(x) = e^x

u = (10^6)\*exp((-10^6)\*t2);

%heavyside input

y = heaviside(t2)\*T;

%convolude

convol = conv(u,y);

%and plot it

plot(t2,convol(1:1001));

title("Problem 4");

xlabel("time (microseconds)");

ylabel("voltage");

disp('Press any key to continue...');

pause;



%problem 5

disp("problem 5");

%time scale

n = 0:0.01:10;

%function

u2 = (exp(-n)).\*sin(n).\*cos(n);

%input

y = heaviside(n);

%convolude

convol2 = conv(u2,y);

%and plot

plot(n,convol2(1:1001));

title("Problem 5");

xlabel("time (seconds)");

ylabel("voltage");

disp('Press any key to continue...');

pause;

disp("done");

