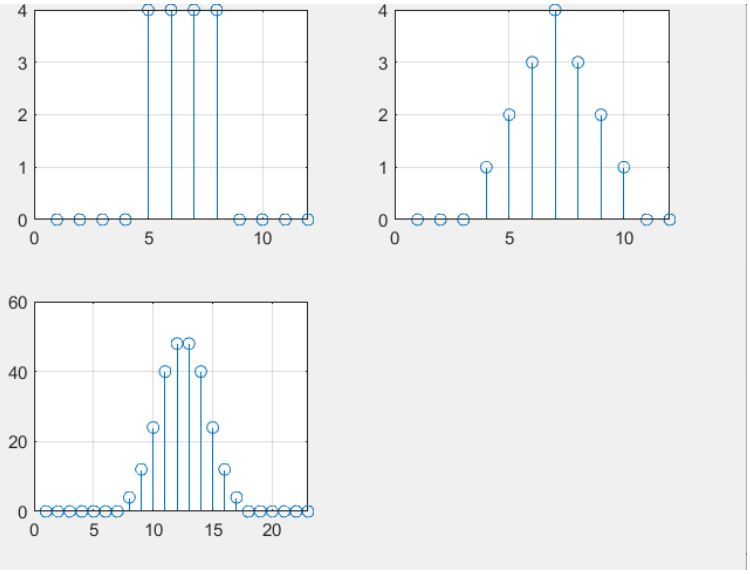
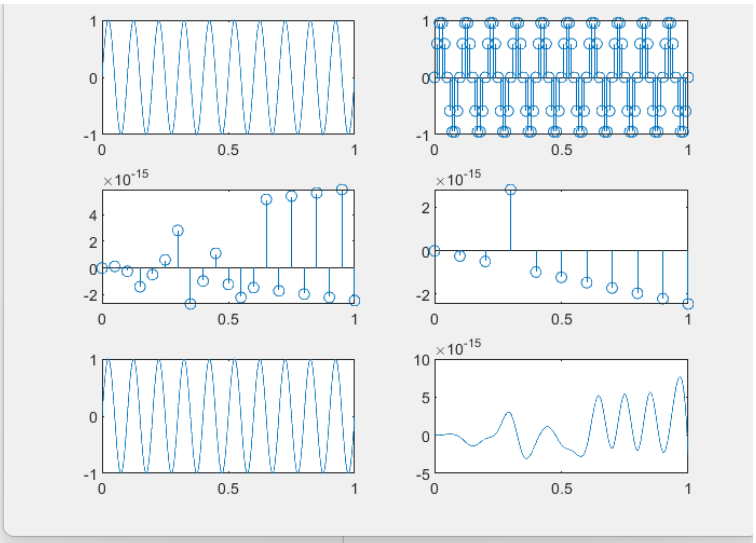
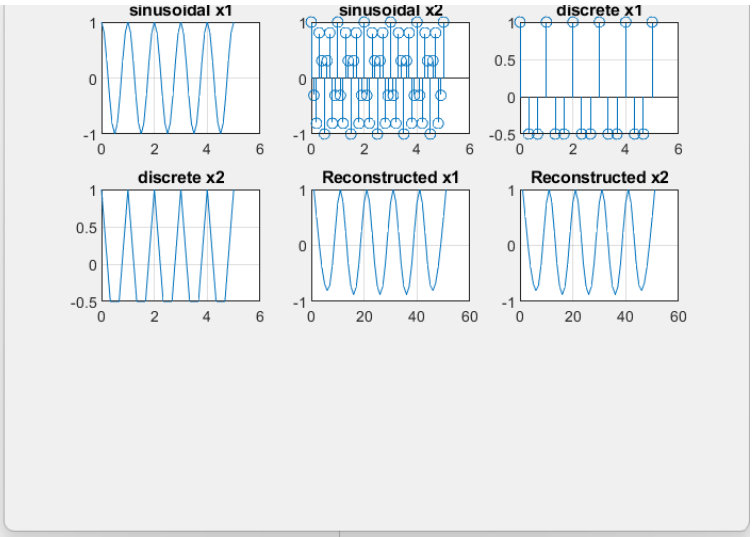
```
v1=[0 0 0 0 4 4 4 4 0 0 0 0];
v2=[0 0 0 1 2 3 4 3 2 1 0 0];
u=conv(v1,v2);
subplot(2,2,1), stem(v1);
grid on;
subplot(2,2,2), stem(v2);
grid on;
subplot(2,2,3), stem(u);
grid on;
```



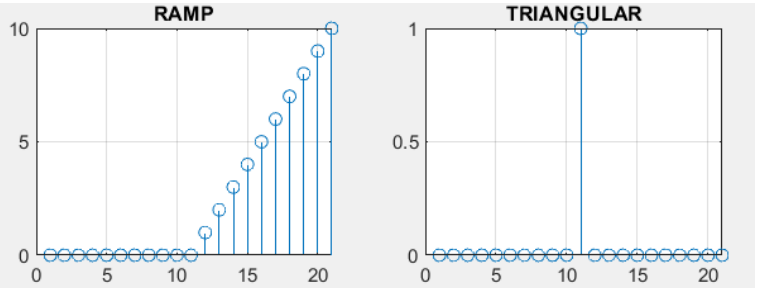
```
t = 0:0.0001:1;
t1 = 0:0.01:1;
t2=0:0.05:1;
t3=0:0.1:1;
x=sin(20*pi*t);
x1=sin(20*pi*t1);
x2=sin(20*pi*t2);
x3=sin(20*pi*t3);
subplot(3,2,1), plot(t,x);
subplot(3,2,2) , stem(t1,x1);
subplot(3,2,3) , stem(t2,x2);
subplot(3,2,4) , stem(t3,x3);
rx1 = spline(t1,x1,t);
rx2 = spline(t2,x2,t);
rx3 = spline(t3,x3,t);
subplot(3,2,5) , plot(t,rx1);
subplot(3,2,6) , plot(t,rx2);
```



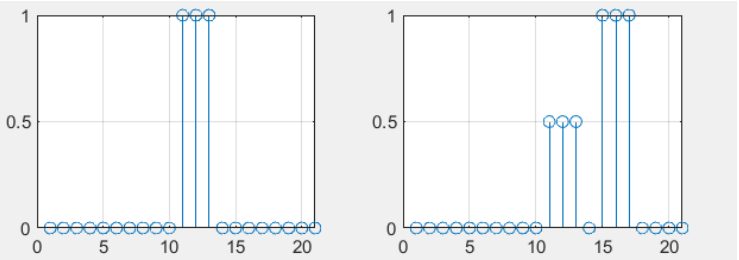
```
t=0:0.1:5;
t1=0:1/3:5;
x1=cos(2*pi*t);
x2=cos(14*pi*t);
subplot(3,3,1), plot(t,x1);
title('sinusoidal x1');
grid on;
subplot(3,3,2), stem(t,x2);
title('sinusoidal x2');
grid on;
n=3;
d_x1=cos(2*pi*t1);
d_x2=cos(14*pi*t1);
subplot(3,3,3), stem(t1,d_x1);
title('discrete x1');
grid on;
subplot(3,3,4), plot(t1,d_x2);
title('discrete x2');
grid on;
subplot(3,3,5), plot(spline(t1, d_x1, t));
title('Reconstructed x1');
grid on;
subplot(3,3,6), plot(spline(t1, d_x2, t));
title('Reconstructed x2');
grid on;
```




```
t=-10:1:10;
ramp=t.*(t>=0);
tri=tripuls(t);
subplot(2,2,1), stem(ramp);
title('RAMP');
grid on;
subplot(2,2,2), stem(tri);
title('TRIANGULAR');
grid on;
```




```
t=-10:10;
x=(1).*(t>=0&t<=2);
h1=(0.5).*(t>=0&t<=2);
h2=(1).*(t>=4&t<=6);
h=h1+h2;
subplot(2,2,1), stem(x);
grid on;
subplot(2,2,2), stem(h);
grid on;
```



```
t=-20:20;
ramp=t.*(t>=0);
mu=5;
s=2;
guass=exp(-0.5*((r-mu)/s).^2)./(s*s
u=conv(ramp, guass);
subplot(2,2,1), stem(r);
title('RAMP');
grid on;
subplot(2,2,2), stem(g);
title('GUASS');
grid on;
subplot(2,2,3), stem(u);
title('CONVULATED');
grid on;
```

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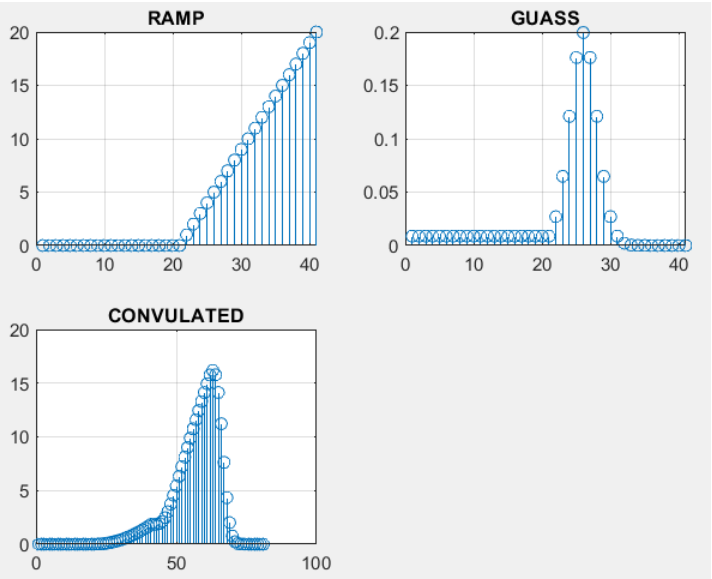
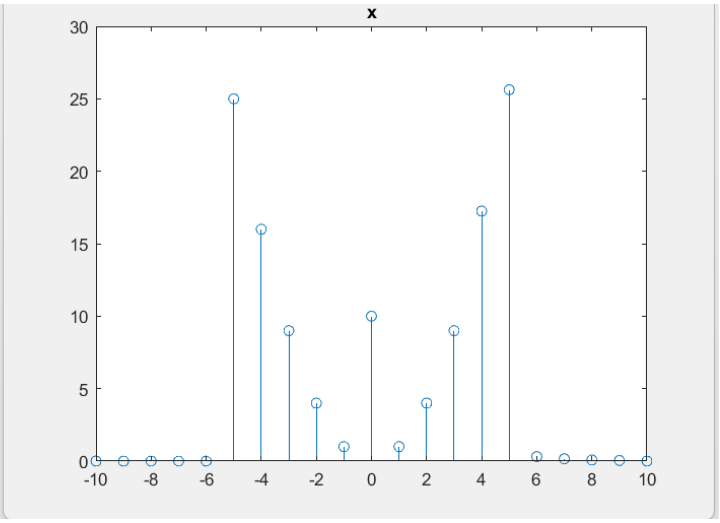
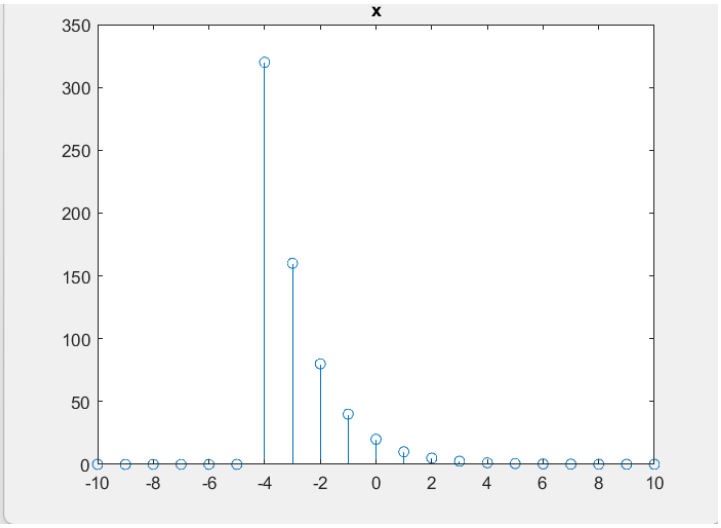



```
n=-10:10;
x1=(1).*(n>=-5);
x2=(1).*(n>=6);
x3=(1).*(n>=4);
x4=(1).*(n>=10);
l=10.*(n==0);
x=(n.^2).*(x1-x2)+l+20.*(0.5.^n).*(x3-x4);
stem(n,x);
title('x');
```




```
n=-10:10;
x1=(1).*(n>=5);
x2=(1).*(n>=-6);
x3=(1).*(n>=-4);
l=10.*(n==5);
x=((0.2.^n).*(x1+x2).*l)+(20.*(0.5.^n).*(x3));
stem(n,x);
title('x');
```



```
syms t;
A=4;
T=2;
f1 = 2*A*t;
f2= 2*A.*(1-t);
a0=(1/T).*(int((f1),t,-0.5,0.5))+int((f2),t,0.5,1.5);
b0=0;
Cn=a0;
w=(2*pi)./T;
an=(2./T).*(int((f1.*cos(n*w*t)),t,-0.5,0.5)+int((f2.*cos(n*w*t)),t,0.5,1.5));
bn=(2./T).*(int((f1.*sin(n*w*t)),t,-0.5,0.5)+int((f2.*sin(n*w*t)),t,0.5,1.5));
cn=sqrt(an.^2+bn.^2);
cn=[Cn cn];
theta0=atan(-b0/a0);
thetan=theta0;
n=0:7;
subplot(211),plot(n,'o'),grid, xlabel('n'),ylabel('C_n'),title('Fourier Series')
subplot(212),plot(n,thetan,'o'),grid,xlabel('n'),ylabel('\theta_n (rad)')
```