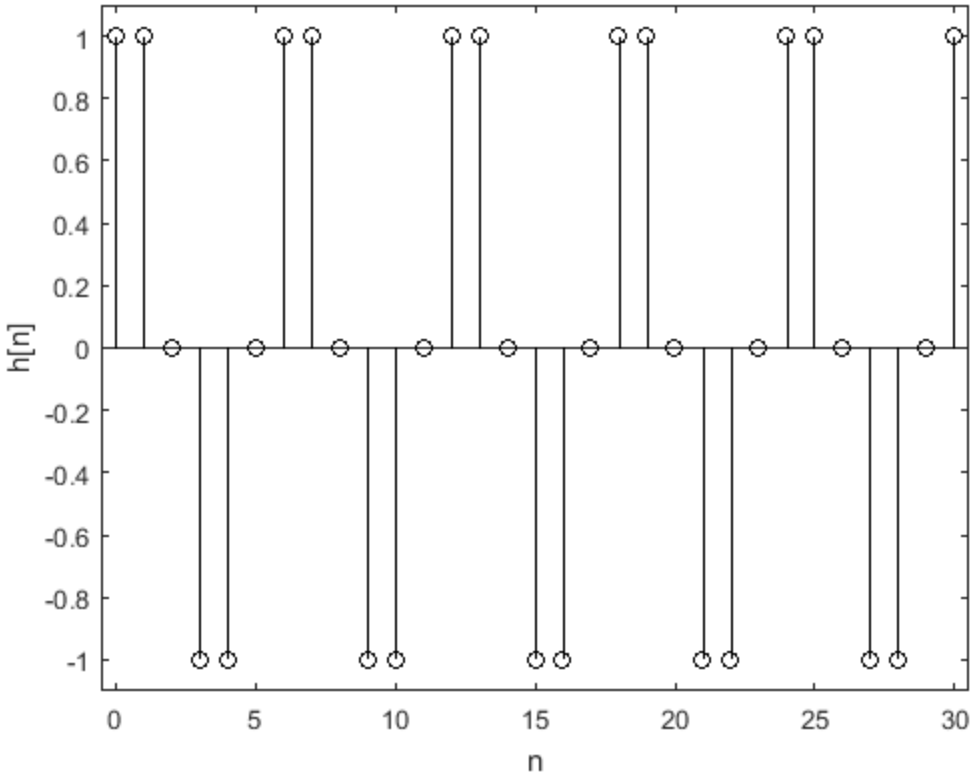
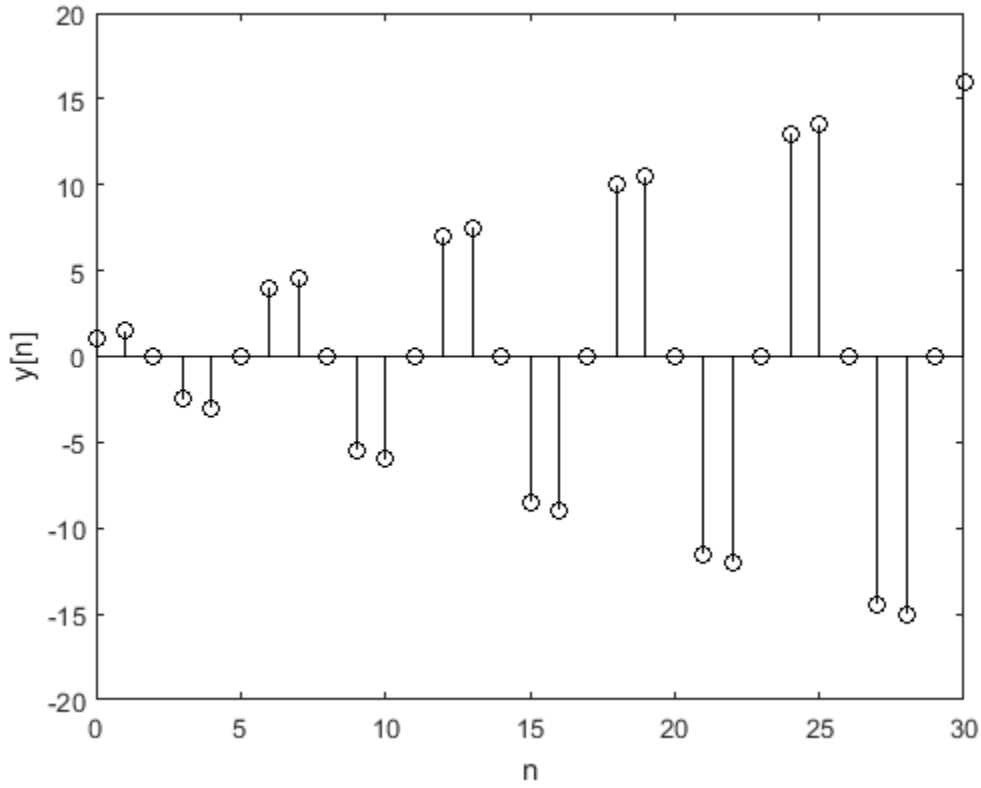
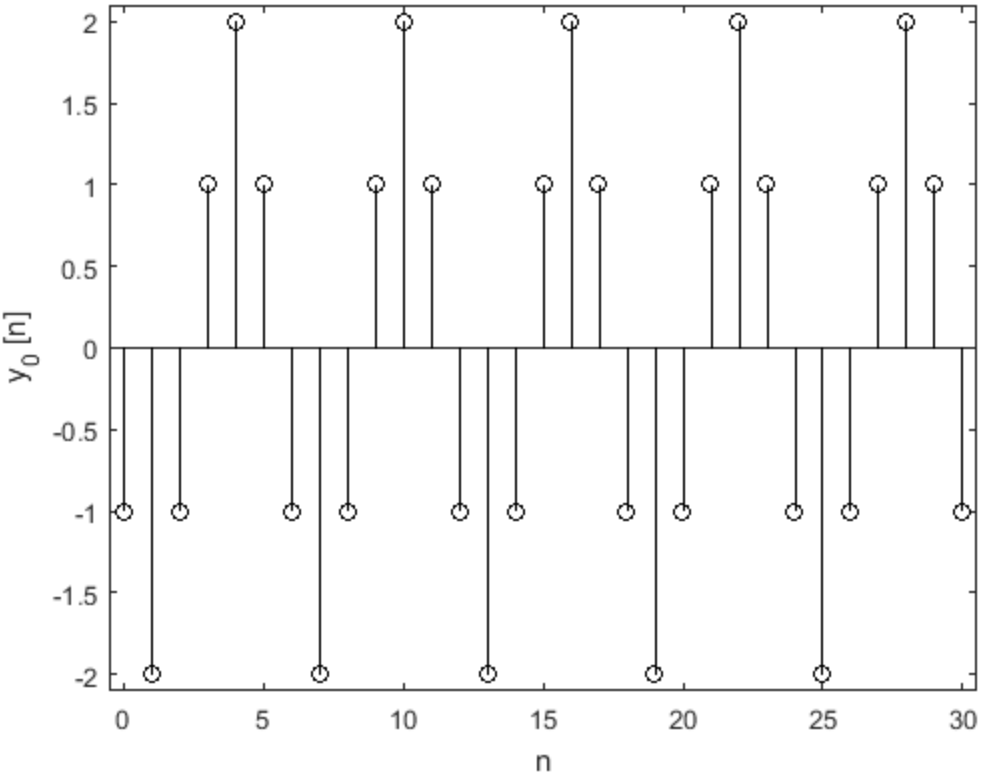
M3.2 Discrete-Time Functions and Stem Plots

```
% MS3P2.m : MATLAB Session 3, Program 2

b = [1 0 0]; a = [1 -1 1];
n = (0:30)'; delta = inline('n==0','n');
h = filter(b,a,delta(n));
stem(n,h,'k'); axis([-.5, 30.5 -1.1 1.1]);
xlabel('n'); ylabel('h[n]');

figure();
x = inline('cos(2*pi*n/6).*(n>=0)','n');
y = filter(b,a,x(n));
stem(n,y,'k'); xlabel('n'); ylabel('y[n]');

figure();
z_i = filtic(b,a,[1 2]);
y_0 = filter(b,a,zeros(size(n)),z_i);
stem(n,y_0,'k'); xlabel('n'); ylabel('y_{0} [n]');
axis([-.5 30.5 -2.1 2.1]);

y_total = filter(b,a,x(n),z_i);


fprintf('The sum is: %s\n',sum(abs(y_total-(y + y_0))));
```

```
The sum is: 1.842970e-14
```


h[n]
n
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
0
5
10
15
20
25
30


y[n]
n
20
15
10
5
0
-5
-10
-15
-20
0
5
10
15
20
25
30



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