
Table of Contents

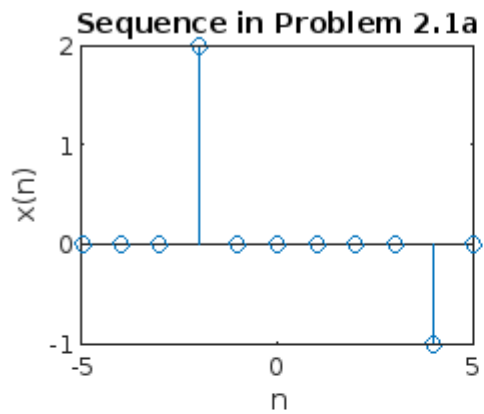
.....	1
a. $x(n) = 2\delta(n+2) - \delta(n-4)$, $-5 \leq n \leq 5$	1
b. $x(n) = n[u(n) - u(n-10)] + 10e^{-0.3(n-10)}[u(n-10) - u(n-20)]$, $0 \leq n \leq 20$	2
c. $x(n) = \cos(0.04\pi n) + 0.2w(n)$, $0 \leq n \leq 50$, where $w(n)$ is a Gaussian	3
d. $x(n) = \{\dots, 5, 4, 3, 2, 1, 5, 4, 3, 2, 1, 5, 4, 3, 2, 1, \dots\}$; $-10 \leq n \leq 9$	4

```
function [x,n] = impseq(n0,n1,n2)
% Generates x(n) = delta(n-n0); n1<=n<=n2
% -----
% [x,n] = impseq(n0,n1,n2)
%
n = n1:n2; x = (n-n0) == 0;
end
```

```
function [x,n] = stepseq(n0,n1,n2)
% Generates x(n) = u(n-n0); n1<=n<=n2
% -----
% [x,n] = stepseq(n0,n1,n2)
%
n = [n1:n2]; x = [(n-n0) >= 0];
end
```

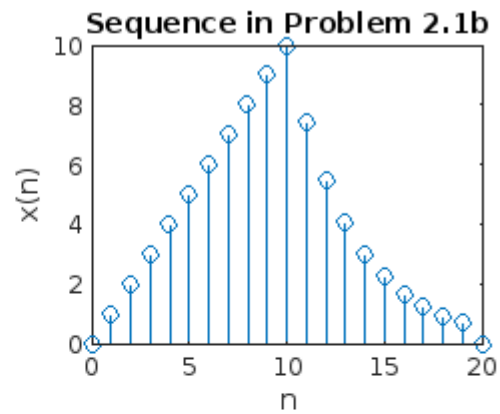
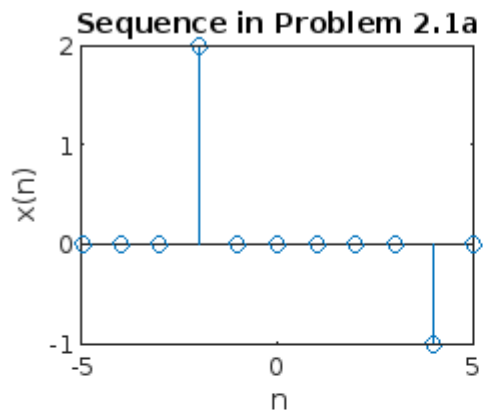
a. $x(n) = 2(n+2) - (n-4)$, $-5 \leq n \leq 5$.

```
n = [-5:5];
x = 2*impseq(-2,-5,5)-impseq(4,-5,5);
subplot(2,2,1);stem(n,x); title('Sequence in Problem 2.1a');
xlabel('n'); ylabel('x(n)');
```



b. $x(n) = n[u(n)-u(n-10)]+10e^{-0.3(n-10)}[u(n-10)-u(n-20)], 0 \leq n \leq 20.$

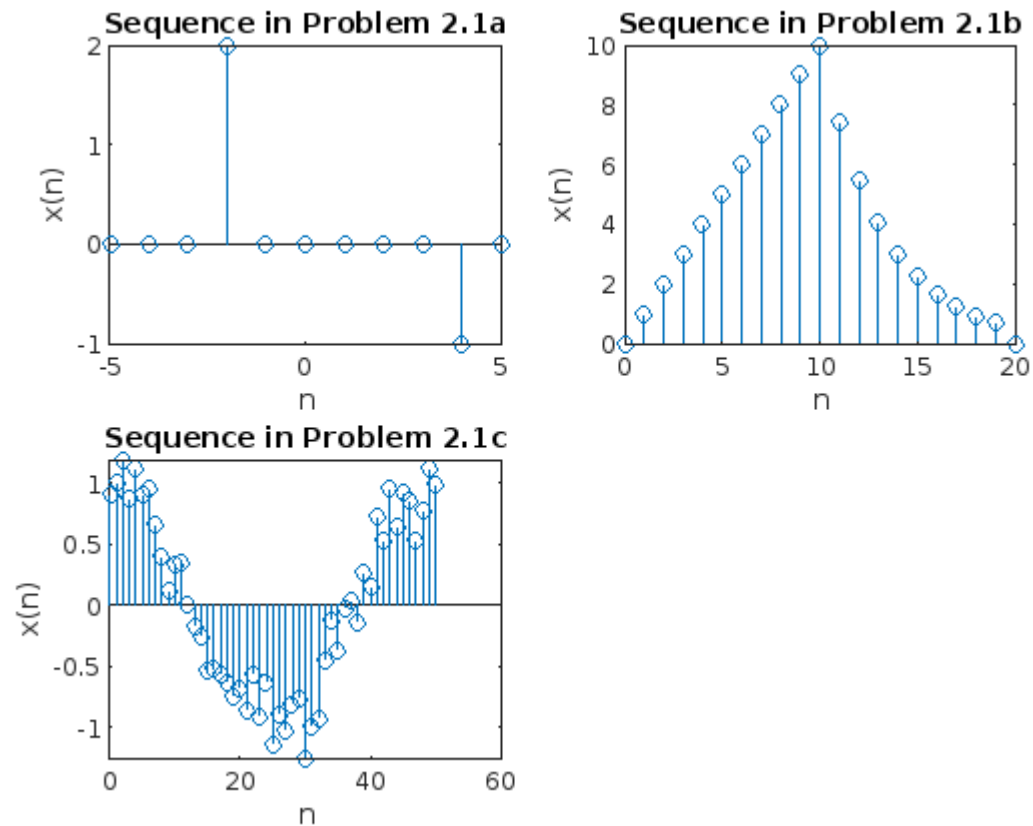
```
n = [0:20];
x1 = n.*(stepseq(0,0,20)-stepseq(10,0,20));
x2 = 10*exp(-0.3*(n-10)).*(stepseq(10,0,20)-stepseq(20,0,20));
x = x1+x2;
subplot(2,2,2); stem (n,x); title('Sequence in Problem 2.1b');
xlabel('n'); ylabel('x(n)');
```



c. $x(n) = \cos(0.04n) + 0.2w(n)$, $0 \leq n \leq 50$, where $w(n)$ is a Gaussian

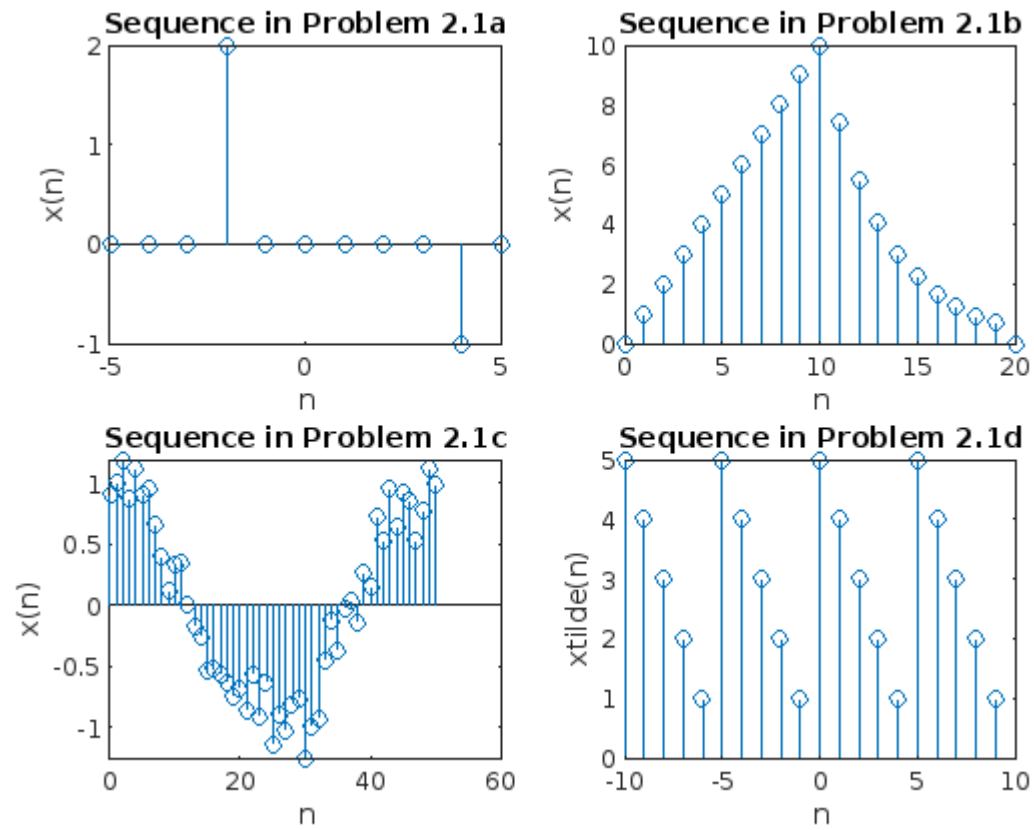
random sequence with zero mean and unit variance.

```
n = [0:50];  
x = cos(0.04*pi*n)+0.2*randn(size(0:50));  
subplot(2,2,3); stem (n,x); title('Sequence in Problem 2.1c');  
xlabel('n'); ylabel('x(n)');
```



d. $x(n) = \{..., 5, 4, 3, 2, 1, 5, 4, 3, 2, 1, 5, 4, 3, 2, 1, ...\}$; $-10 \leq n \leq 9$.

```
n = [-10:9]; x = [5,4,3,2,1];
xtilde = x'*ones(1,4); % P columns of x; x is a row vector
xtilde = xtilde(:); % long column vector
xtilde = xtilde'; % long row vector
subplot(2,2,4); stem(n,xtilde); title('Sequence in Problem 2.1d');
xlabel('n'); ylabel('xtilde(n)');
```



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