
Table of Contents

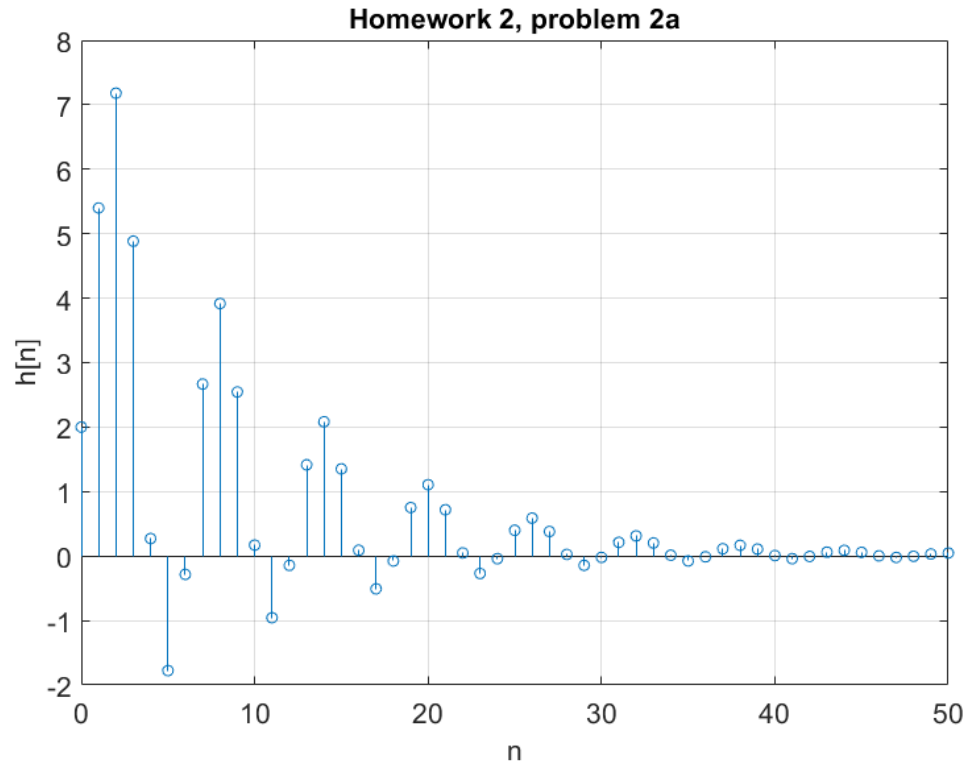
.....	1
Part a of Problem 3	1
Part b of Problem 2	2
Part c of Problem 2	3
Part d	4

```
% Author: Spencer Goulette  
% ECE 486 - HW #2 Problem 2  
% February 5th, 2018
```

```
clear variables
```

Part a of Problem 3

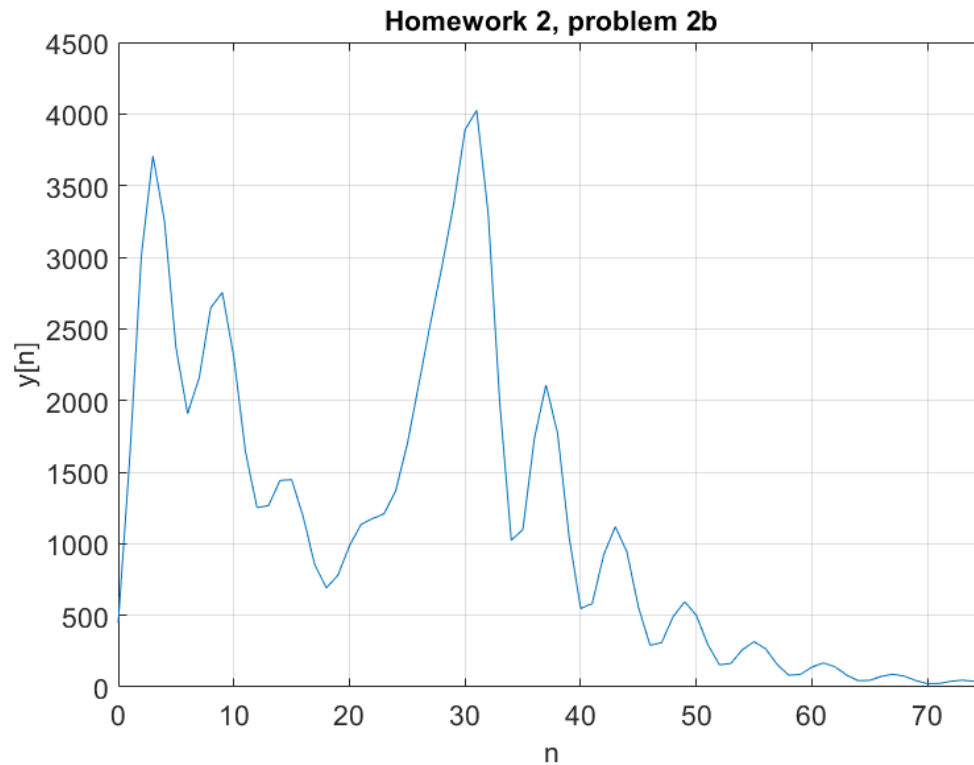
```
a = [1 -1.3 0.72 0.081 -0.3645]; % a constants for y  
b = [2.0 2.8 1.6 -0.4 -1.2]; % b constants for x  
n = linspace(0,50,51); % n from 0 to 50  
h = impz(b,a,51); % impulse h[n]  
  
Fig1 = figure('Position', [200, 75, 850, 600]); % set figure size and  
location  
stem(n,h); % stem plot  
grid on; % add grid  
set(gca, 'fontsize', 16); % increase font size  
xlabel('n', 'fontsize', 16); % x label  
ylabel('h[n]', 'fontsize', 16); % y label  
title('Homework 2, problem 2a', 'fontsize', 16); % title
```



Part b of Problem 2

```
n1 = linspace(0,75,76); % n from 0 to 75
n = linspace(0,30,31); % n from 0 to 30 since x is zero outside those
    bounds
x = (n - 15).^2; % x[n] = (n - 15)^2 for 0 to 30, 0 otherwise
x(numel(n1)) = 0; % adds zeros to x to make it the same size as n1
y1 = filter(b,a,x); % filters

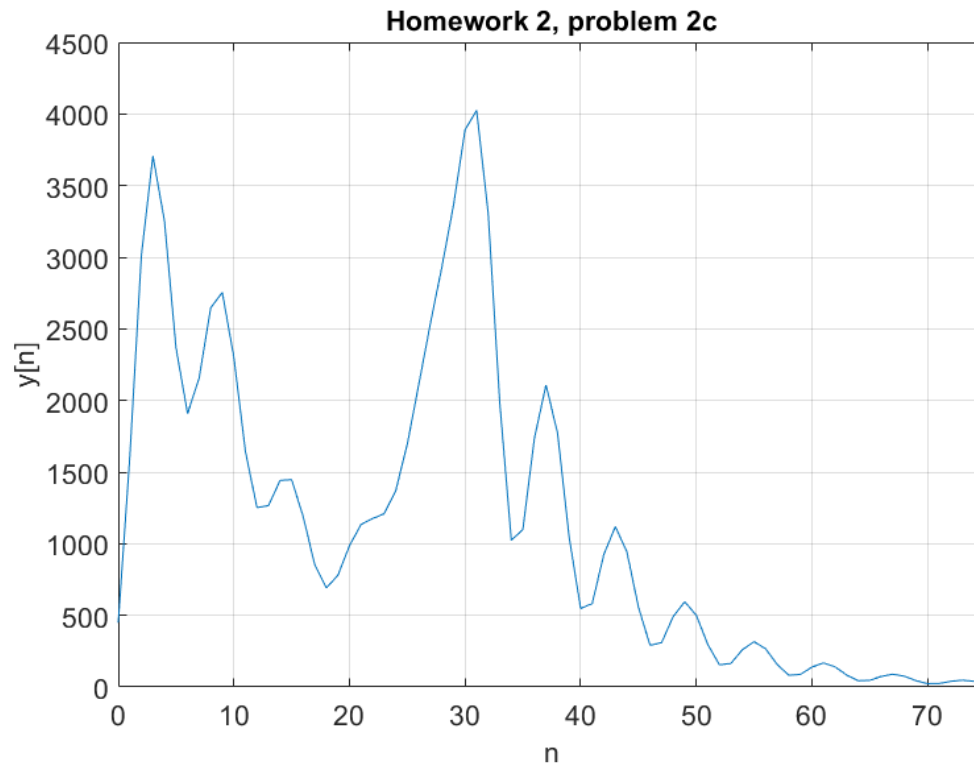
Fig2 = figure('Position', [200, 75, 850, 600]); % set figure size and
    location
plot(n1,y1); % plot y
xlim([0 75]); % limit x axis from 0 to 75
grid on; % add grid
set(gca, 'fontsize', 16); % increase font size
xlabel('n', 'fontsize', 16); % x label
ylabel('y[n]', 'fontsize', 16); % y label
title('Homework 2, problem 2b', 'fontsize', 16); % title
```



Part c of Problem 2

```
n2 = linspace(0,150,151); % n from
h = impz(b,a,76); % takes impulse from 0 to 76
y2 = conv(h,x); % does the convolution

Fig3 = figure('Position', [200, 75, 850, 600]); % set figure size and
location
plot(n2,y2); % plots
xlim([0 75]); % limit x axis from 0 to 75
grid on; % add grid
set(gca, 'fontsize', 16); % increase font size
xlabel('n', 'fontsize', 16); % x label
ylabel('y[n]', 'fontsize', 16); % y label
title('Homework 2, problem 2c', 'fontsize', 16); % title
```



Part d

```
total = 0; % total to find difference between part b and part c
for i = 1:76 % goes from 0 to 75 for n
    total = total + abs(y1(i) - y2(i)); % totals the difference
    between part b and c
end
if total < 1e-9 % approximately zero
    s = 'Part b and c are about the same';
    disp(s) % tells if they are about the same
end
% show difference total (usually comes out to 2.76e-11)
disp(total)
```

```
Part b and c are about the same
2.7566e-11
```

Published with MATLAB® R2017b