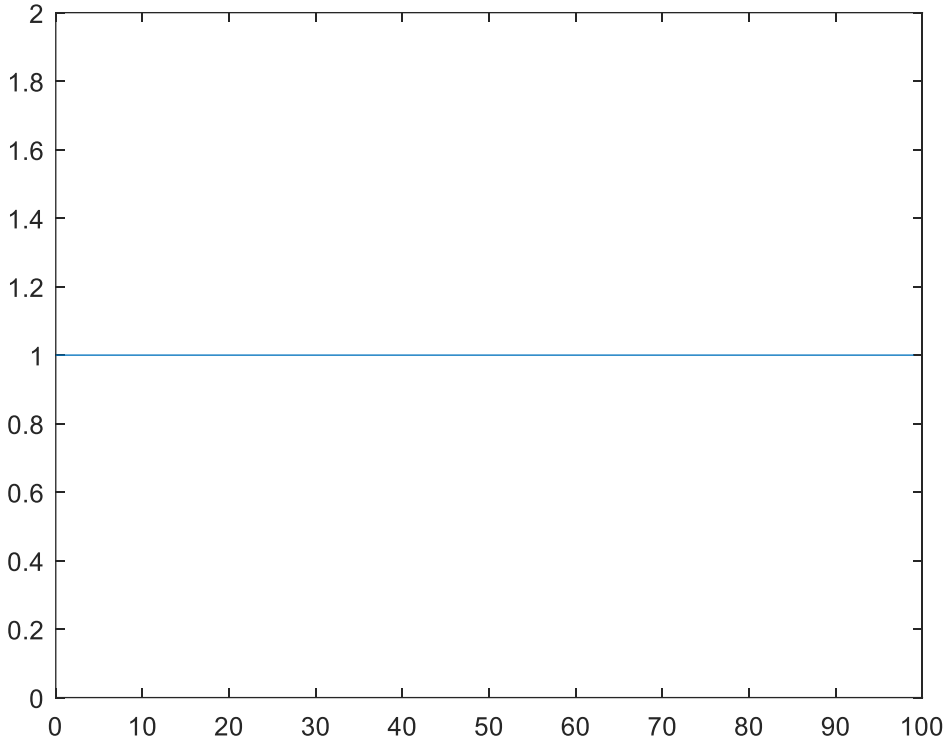
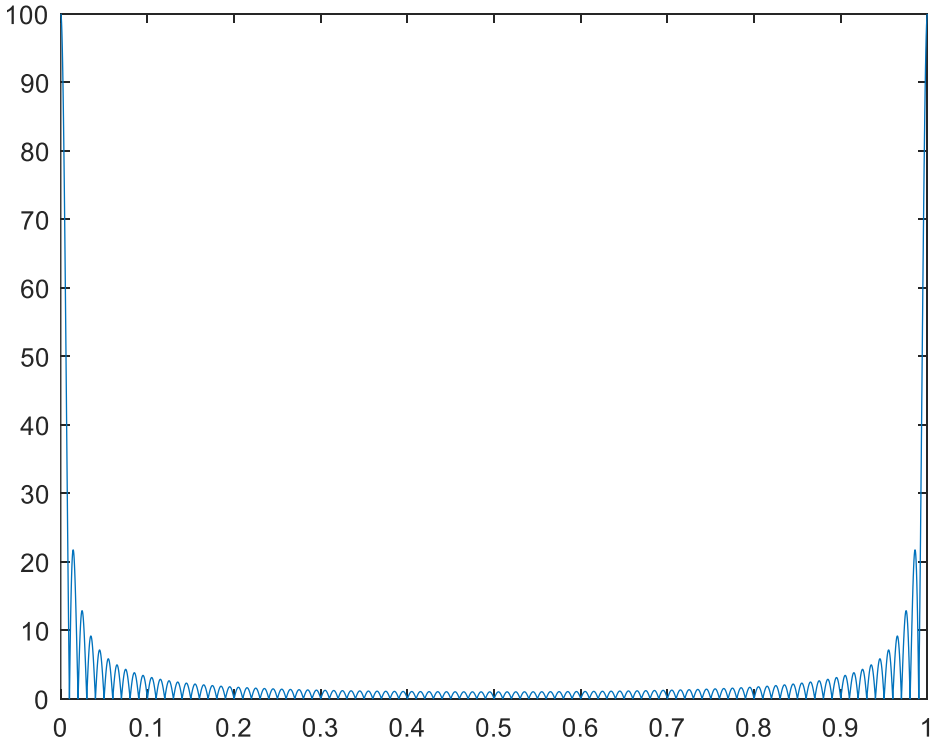
Rectangular Window

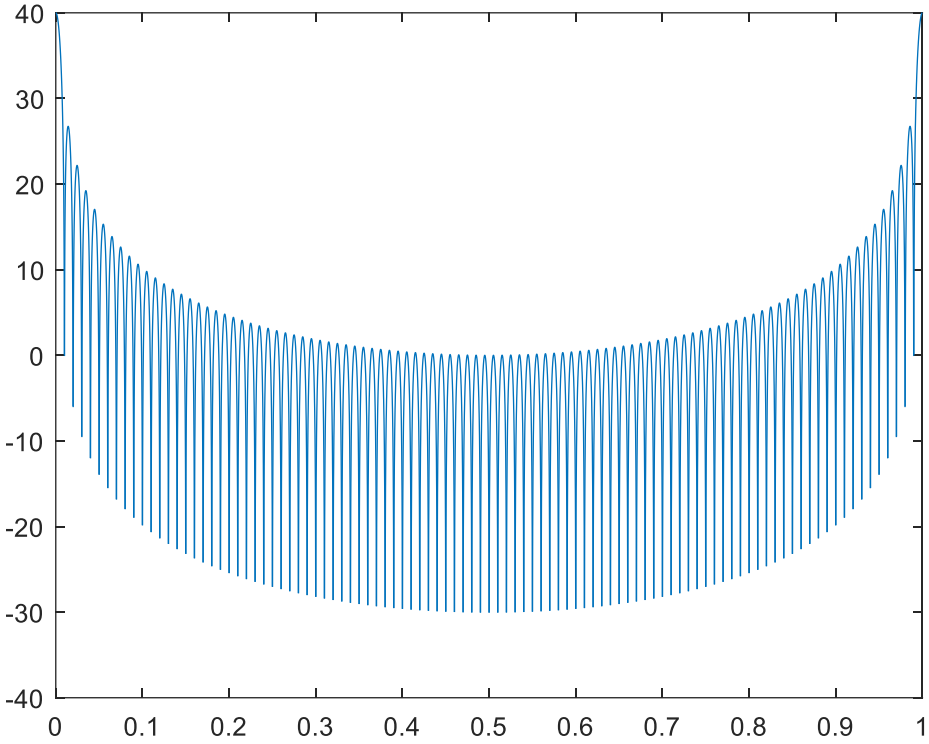
```
>> N=100;
>> NFFT = 10000;
>> k=0:NFFT-1;
>> fk=k/NFFT;
>> win1 = ones(N,1);
>> Win1 = fft(win1, NFFT);
>> n=0:N-1;
>> figure(1), plot(n,win1)
```



figure(2), plot(fk, abs(Win1))

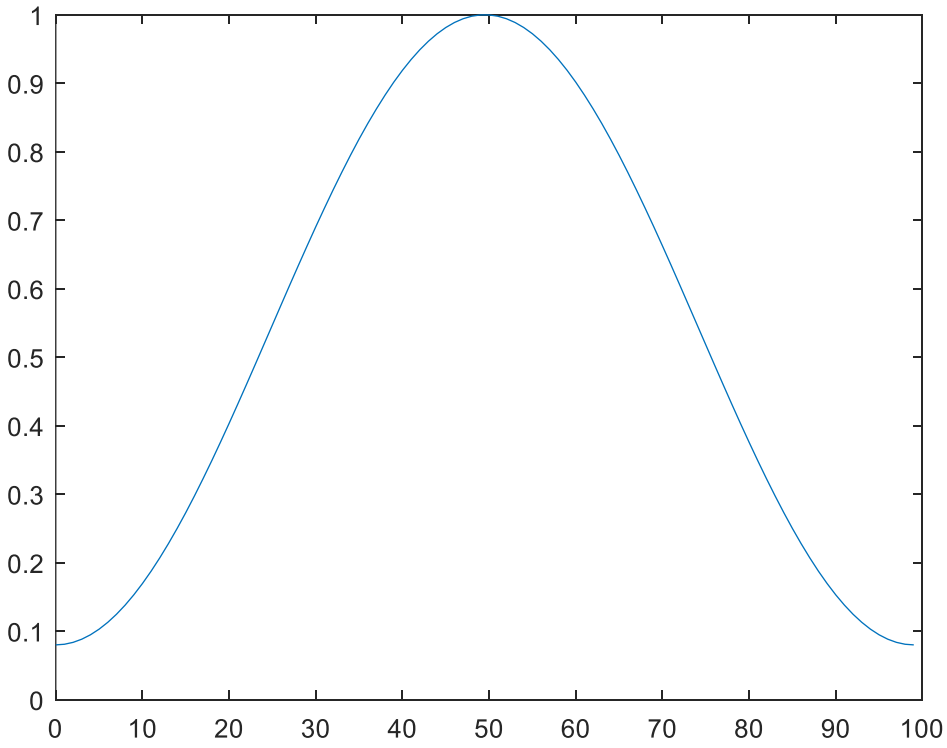


figure(3), plot(fk, 20*log10(abs(Win1)))

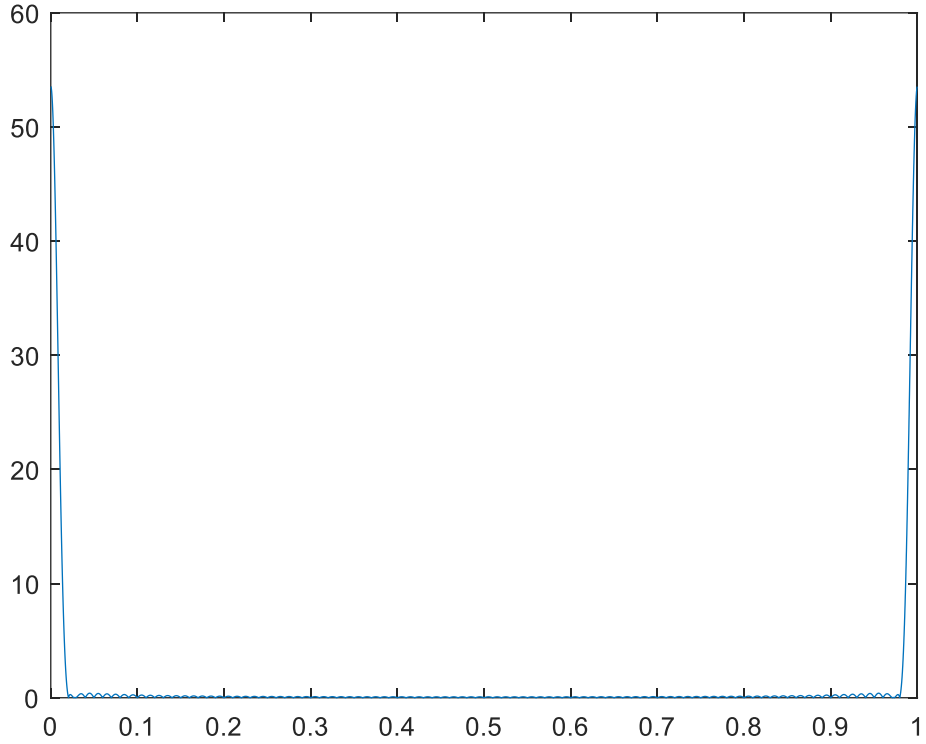


Hamming Window

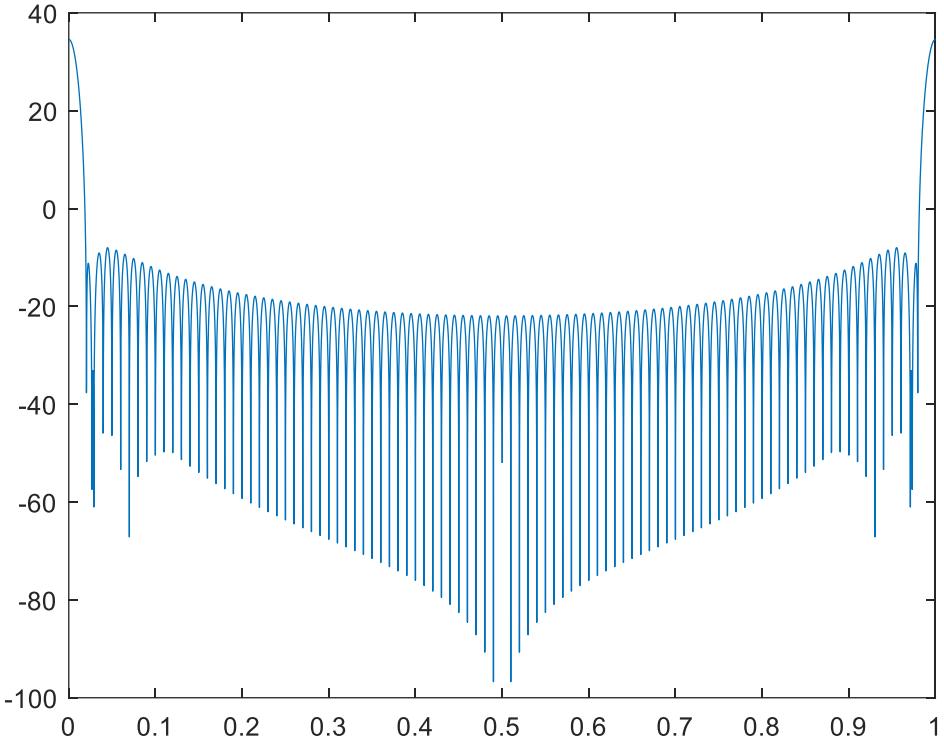
```
>> win2 = hamming(N);

>> Win2 = fft(win2 , NFFT);
```



figure(5), plot(fk, abs(Win2))

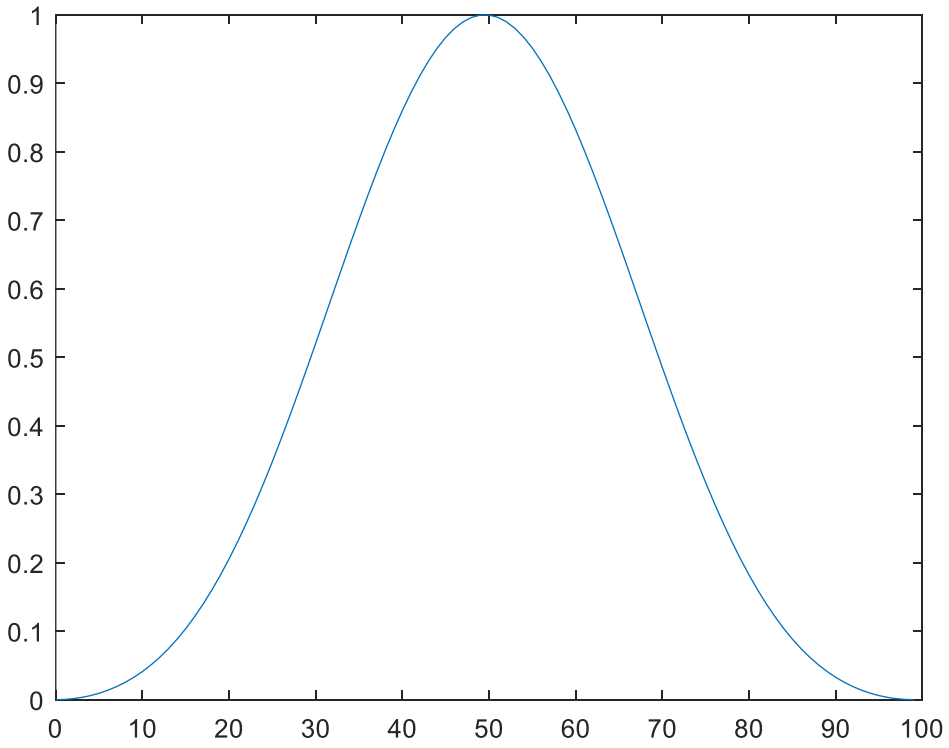


```
>> figure(6), plot(fk, 20*log10( abs(Win2) ) )
```

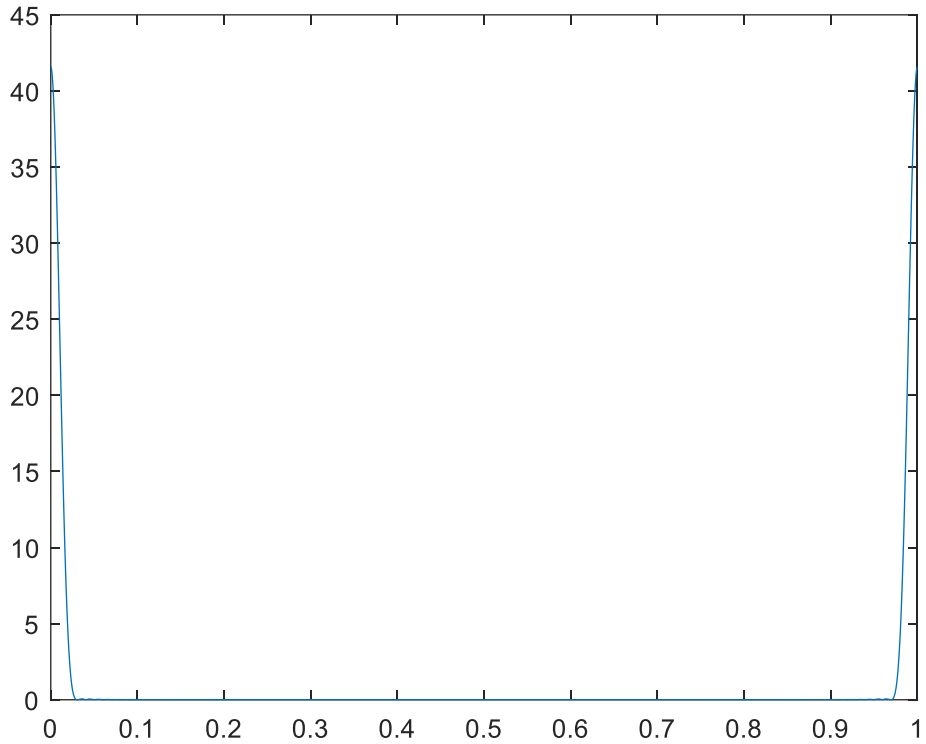


Blackman Window

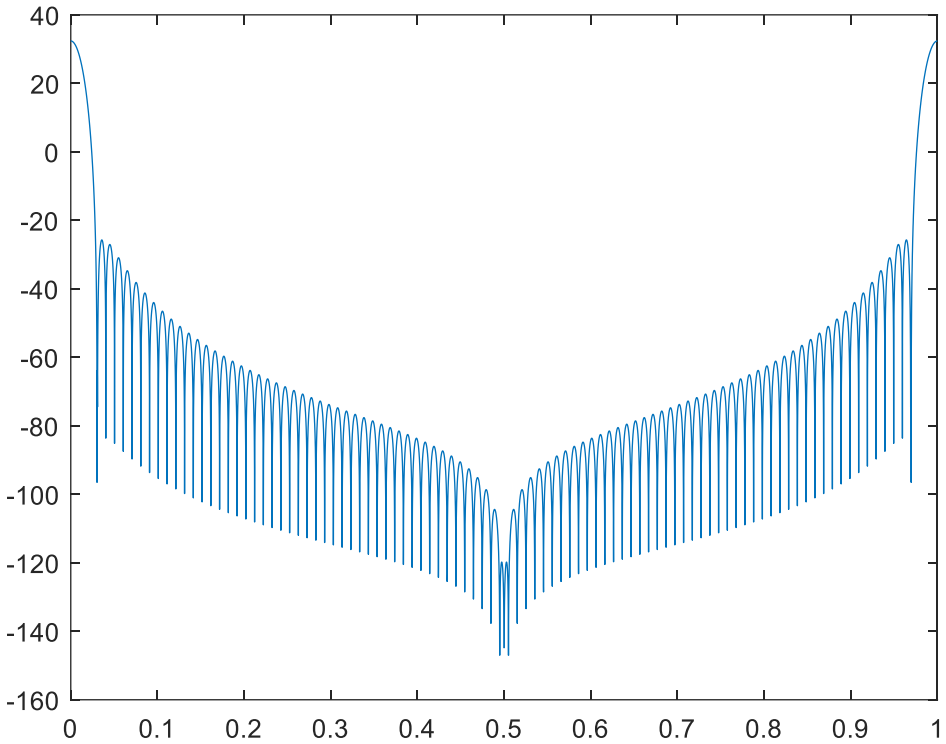
```
>> win3 = blackman(N);

>> Win3 = fft( win3 , NFFT );

>> figure(7), plot(n, win3)
```



```
>> figure(8), plot(fk, abs(Win3) )
```

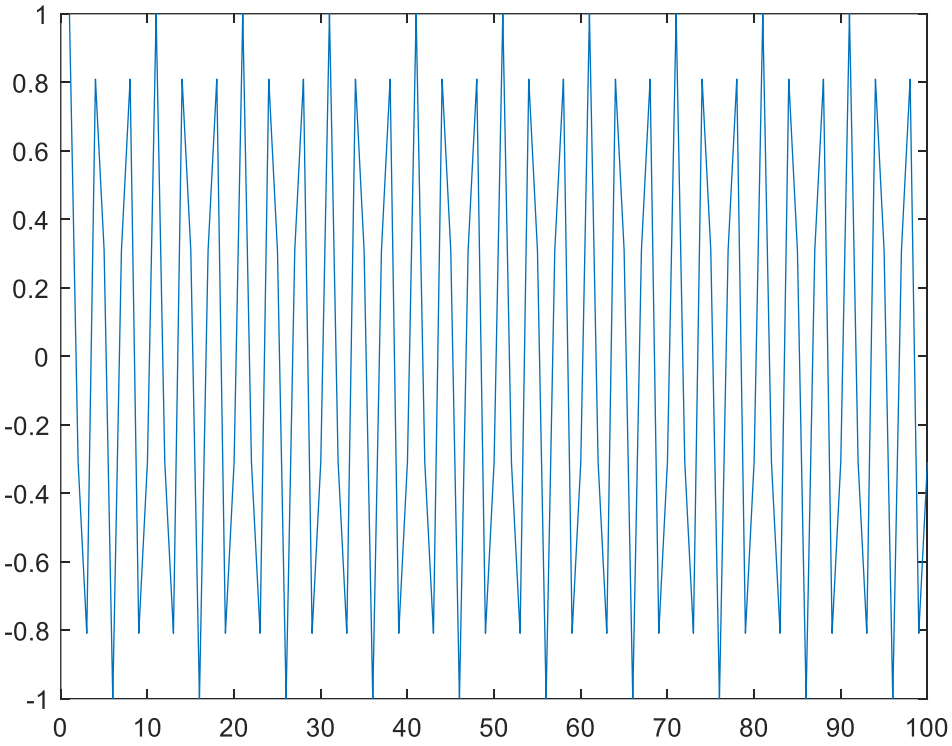


```
>> figure(9), plot(fk, 20*log10( abs(Win3) ) )
```

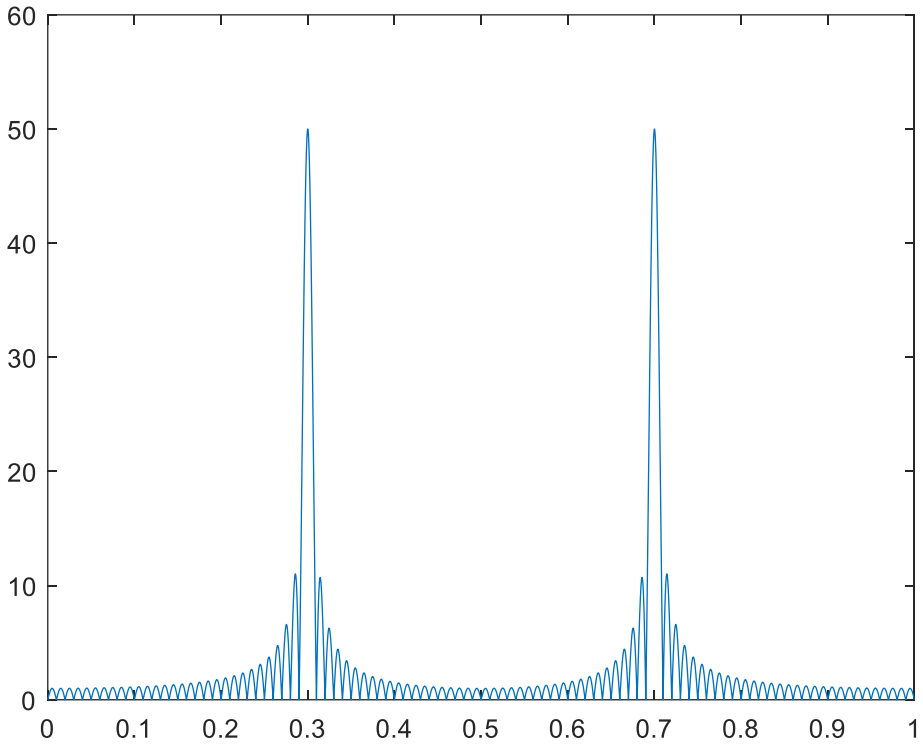


Application to a sinusoid

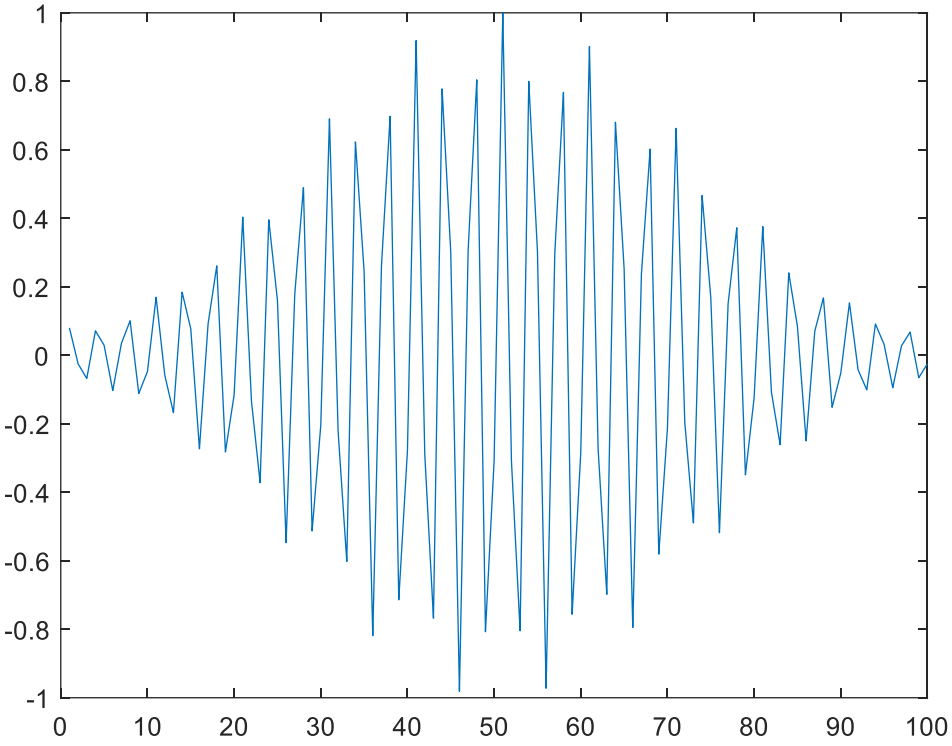
```
>> x = cos(2*pi*0.3*n);
>> x = x' ;  % Transpose x into a column vector
>> X1 = fft(x , NFFT);   % Use a rectangular window
>> plot(x)
```



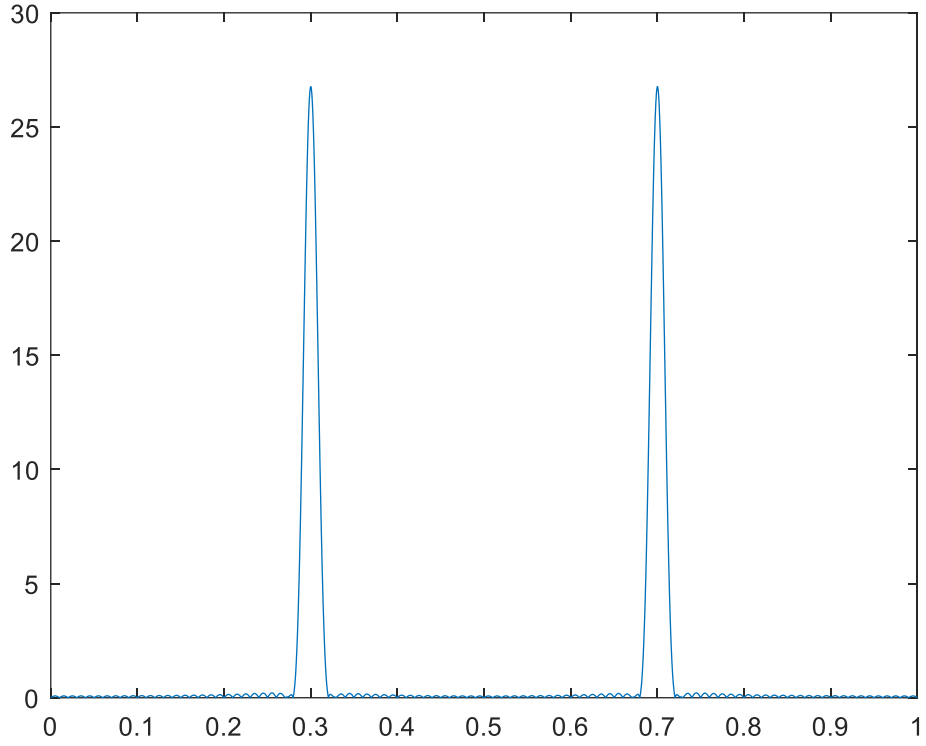
```
>> figure(10), plot(fk, abs(X1))
```



```
>> X2 = fft(x.*win2 , NFFT);   % Use a Hamming window

>> plot(x .* win2)
```



```
>> figure(11), plot(fk, abs(X2))
```



```
>> X3 = fft(x.*win3 , NFFT);  % Use a Blackman window
>> figure(12), plot(fk, abs(X3))
```