

continuous discrete fourier transform

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Hello guys,

I am a student doing some homework exercises on Fourier transform to study its behavior. When I tried to apply discrete Fourier transform continuously to a certain number sequence several times, I found an interesting phenomenon's very interesting.

For example, I have an arbitrary number sequence which present the original input signal.

```
x = [ 2 8 3 6 1 7 ];
```

and I do the discrete Fourier transform on x four times, which means I can obtain a new sequence y in this way

```
y = dft( dft( dft( dft( x ) ) ) );  
= 1.0e+02 * [  
0.7200 - 0.0000i  
2.8800 + 0.0000i  
1.0800 - 0.0000i  
2.1600 + 0.0000i  
0.3600 - 0.0000i  
2.5200 + 0.0000i ];
```

It is very interesting to discover that the imaginary components of y are all 0. Moreover, if I do a simple calculation to the real components of y with x like this

```
c = real( y ) ./ x = 36;
```

I always got a constant c, no matter what is the initial condition of sequence x. However, I can not figure out the reason so far. If any one could help me on this issue, please write back.

Sincerely,

Ping

