EXERCISE 8.7: Use MATLAB to compute samples of the signal $x_0[n] = 5\cos(0.211\pi n)$ for $n = 0, 1, \ldots, 499$. Compute and plot the magnitude of the $(N = 16384)$-point DFT of the length-500 sequence $x_0[n]$ using the MATLAB statements

```
x0=5*cos( 0.211*pi*(0:499) );
N=16384;
X0 = fft(x0,N);   %- fft takes care of zero padding
plot( (0:N/2)*2*pi/N , abs(X0(1:N/2+1)) );
```

Check to see if the peak height satisfies the relation $AL/2$ mentioned above. Repeat the above steps for the following length-5000 input signal:

$$x_3[n] = \begin{cases} 0.5\cos(0.4\pi n) & \text{for } n = 5000, 5001, \ldots, 9999 \\ 0 & \text{otherwise} \end{cases}$$

Overlay the two plots by using MATLAB's `hold on` command before plotting the second DFT. Explain why the spectral peak height is the same for both signals even though their amplitudes differ by a factor of ten.