

PROBLEM:

Suppose that a MATLAB function has been written to calculate a sum of discrete-time sinusoids, e.g., something similar to the function that was written for the lab. Here is the actual function:

```
function xn = makedcos(omegahat, XX, Length)
xn = real( exp( j*(0:Length-1)'*omegahat(:)' ) * XX(:) );
```

- (a) Write an equation for $x[n]$, the discrete-time signal that is created by this MATLAB function, when the following function call is used:

```
xn = makedcos(pi*[0, 0.25, 0.75, 1.75], [1, 1-1i, -7i, 2i], 200001)
```

Your equation should be in terms of cosine functions. To do this you must figure out how the matrix multiplications and $\exp(\)$ in the MATLAB statement defining xn work. (For this part, ignore the fact that the total length of the signal xn is finite.)

- (b) Draw a plot of the discrete-time spectrum (vs. $\hat{\omega}$) of the discrete-time signal defined by this MATLAB operation. Make sure that you include all the spectrum components in the $-\pi$ to $+\pi$ interval.