

## PROBLEM:

Suppose that MATLAB is used to plot a sinusoidal signal. The following MATLAB code generates a signal  $x[n]$  and plots it. Unfortunately the plot does not have its time axis labeled properly.

```
dt = 1/400;  
Duration = 0.05;  
tt = 0 : dt : Duration;  
xx = real( exp( j*(2500*pi*tt + pi/2) ) );      %--- j = sqrt(-1)  
stem( xx )      %<--- OOPS! there is no time axis
```

- Sketch a plot of the signal as it would be done by the `stem(xx)` function.
- For the plot above, determine the correct formula for the discrete-time signal in the form:  $x[n] = A \cos(\hat{\omega}_0 n + \phi)$  using the smallest possible  $\hat{\omega}_0$ .
- Determine the period of  $x[n]$ , i.e., find  $N_0$  where  $x[n + N_0] = x[n]$ .