

PROBLEM:

A digital chirp signal is synthesized according to the following formula:

$$x[n] = \Re\{e^{j\theta[n]}\} = \cos(\pi(0.16 \times 10^{-2})n^2) \quad \text{for } n = 0, 1, 2, \dots, 200$$

- Make a plot of the rotating phasor $e^{j\theta[n]}$ for $n = 1, 20$ and 40 .
- If this signal is played out through a D-A converter whose sampling rate is 8 kHz, make a plot of the instantaneous analog frequency (in Hertz) versus time for the analog signal.
- If the *constant frequency* digital signal $v[n] = \cos(0.55\pi n)$ is played out through a D-A converter whose sampling rate is 8 kHz, what (analog) frequency will be heard?