PROBLEM:

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

$$x[n] = \Re e\{e^{j\theta[n]}\} = \cos(\pi(0.6 \times 10^{-3})n^2) \qquad \text{for } n = 0, 1, 2, \ldots, 200$$

(a) Make a plot of the rotating phasor $e^{j\theta[n]}$ for $n = 10$, 50 and 100.

(b) If this signal is played out through a D-A converter whose sampling rate is 10 kHz, make a plot of the instantaneous analog frequency (in Hertz) versus time for the analog signal.

(c) If the *constant frequency* digital signal $v[n] = \cos(0.6\pi n)$ is played out through a D-A converter whose sampling rate is 10 kHz, what (analog) frequency will be heard?