

PROBLEM:

A chirp signal is synthesized according to the following formula:

$$x(t) = \Re\{e^{j2\pi(500t^2 + 700t + 900)}\} \quad \text{for } 0 \leq t \leq 3$$

- Derive the sinusoidal formula for $x(t)$.
- Determine the formula for the instantaneous frequency of the chirp.
- Make a plot of the instantaneous frequency versus time.
- Derive a formula similar to $x(t)$ for a chirp signal whose instantaneous frequency starts at 7 kHz and falls linearly to 3 kHz in 3 seconds.