Lab 2 (DataComm)

Complex exponential Signals

Objectives:

- Plot various continuous and discrete Complex exponential signals.

Theory:

The continuous-time complex exponential signal is of the form:

$x(t) = Ce^{at}$

where ‘C’ and ‘a’ are, in general, complex numbers.

Depending upon the values of these parameters, the complex exponential can exhibit several different characteristics.

Some functions to be used:

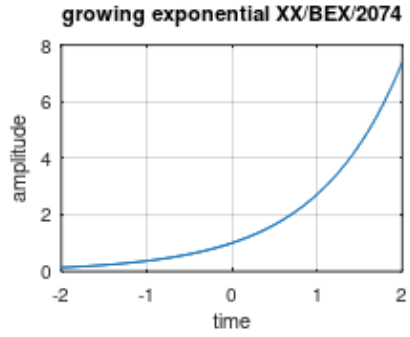
plot( ) , stem( ), hold on, axis( ) ,exp( )

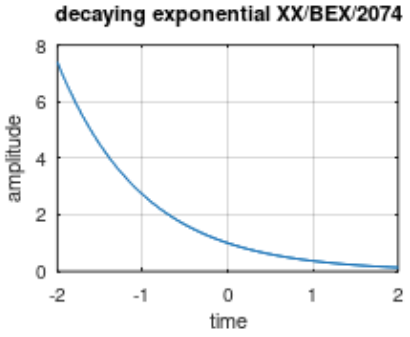
Problems:

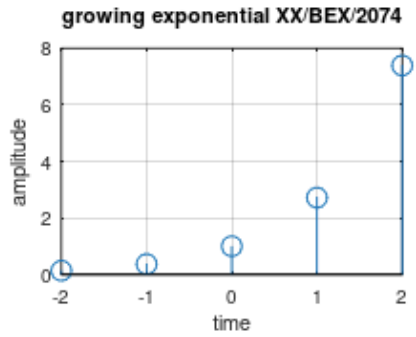
Write programs to generate well labeled plot following signal

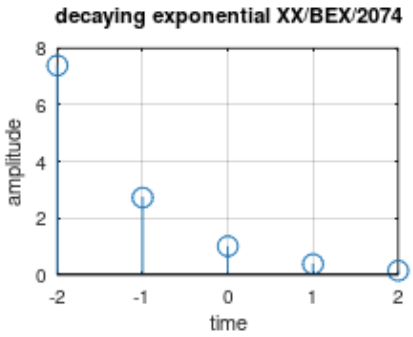
1. $x(t) = e^{at}$ where ‘a’ is purely real. Chose both +ve and -ve values of ‘a’.
2. Plot same signal taking ‘a’ as purely imaginary (Plot real and imaginary part separately. a=jw)
3. When a = r + jw , plot $x(t) = e^{at}$ by taking r= +ve and r = -ve . (Plot real and imaginary part separately)
4. Plot discrete counterpart of each signals.

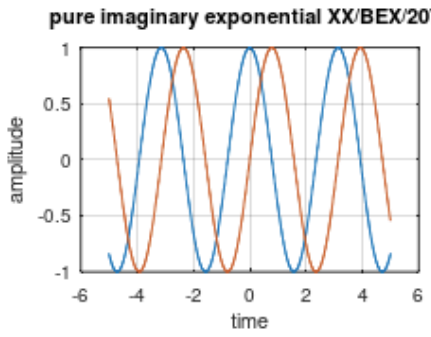
Some expected output:

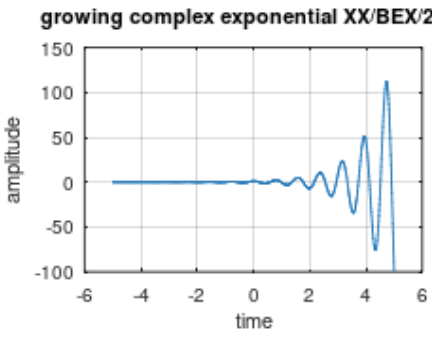

growing exponential XX/BEX/2074
amplitude
time

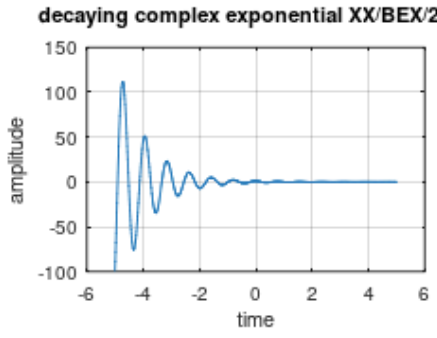

decaying exponential XX/BEX/2074
amplitude
time

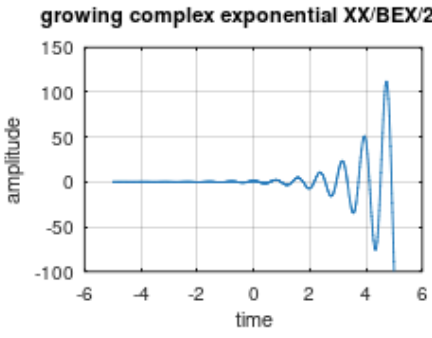

growing exponential XX/BEX/2074
amplitude
time


decaying exponential XX/BEX/2074
amplitude
time


pure imaginary exponential XX/BEX/2074
amplitude
time


growing complex exponential XX/BEX/2074
amplitude
time


decaying complex exponential XX/BEX/2074
amplitude
time


growing complex exponential XX/BEX/2074
amplitude
time