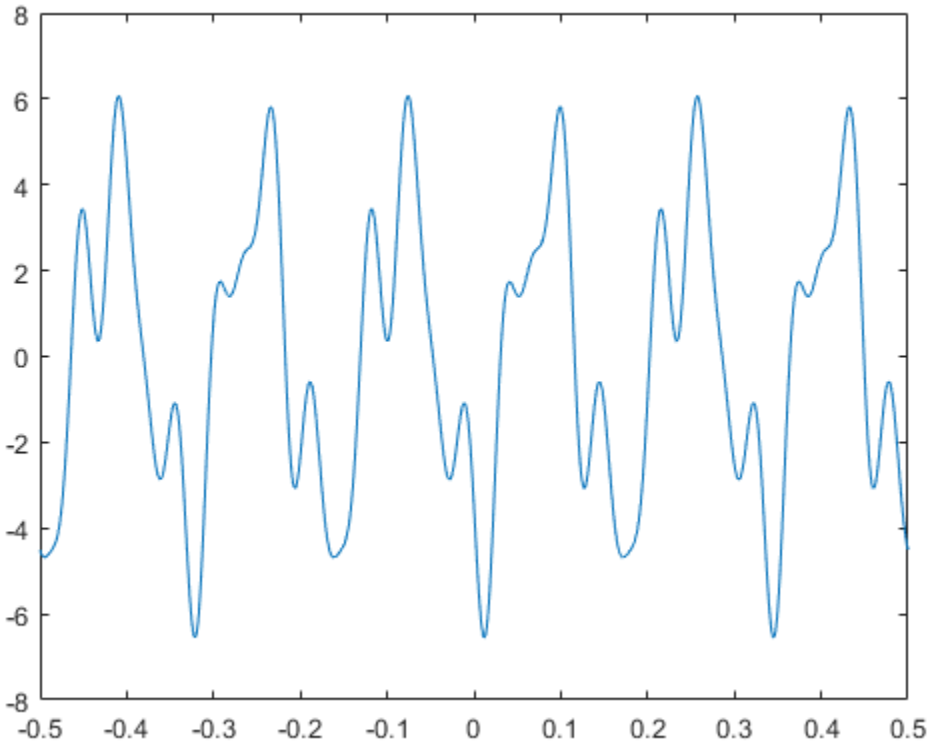
3.3.1

```
ss(1).freq = 27; ss(1).complexAmp = exp(1j*pi/3);
ss(2).freq = 18; ss(2).complexAmp = 2i;
ss(3).freq = 6; ss(3).complexAmp = -4;
%
dur = 1;
tstart = -0.5;
dt = 1/(27*32); %-- use the highest frequency to define delta_t
%
ssOut = addCosVals( ss, dur, tstart, dt );
%
plot( ssOut.times, ssOut.values ) %
```

```
function sigOut = addCosVals( cosIn, dur, tstart, dt )
%ADDCOSVALS Synthesize a signal from sum of sinusoids
%(do not assume all the frequencies are the same)
%
% usage: sigOut = addCosVals( cosIn, dur, tstart, dt )
%
% cosIn = vector of structures; each one has the following fields:
%   cosIn.freq = frequency (in Hz), usually none should be negative
%   cosIn.complexAmp = COMPLEX amplitude of the cosine
%
% dur = total time duration of all the cosines
% start = starting time of all the cosines
% dt = time increment for the time vector
%
% The output structure has only signal values because it is not necessarily a
 sinusoid
%   sigOut.values = vector of signal values at t = sigOut.times
%   sigOut.times = vector of times, for the time axis
%
% The sigOut.times vector should be generated with a small time increment that
%   creates 32 samples for the shortest period, i.e., use the period
%   corresponding to the highest frequency cosine in the input array of
 structures.

% <--- Write your code here --->
n = length(cosIn); % number of sinusoids
t = tstart:dt:tstart+dur; % time vector
x = zeros(1, length(t)); % initialize sum of sinusoids

% calculate sum of sinusoids
for k = 1:n
    x = x + cosIn(k).complexAmp * exp(1j * 2 * pi * cosIn(k).freq * t );
end

% store results in output structure
sigOut.values = x;
```

```
sigOut.times = t;

end
```

Warning: Imaginary parts of complex X and/or Y arguments ignored.



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