Fall 2018   EE 313 Linear Systems and Signals   Prof. Evans

Homework #1

Sinusoidal Signals

Assigned on Friday, August 31, 2018
Due on Friday, September 7, 2018, by 5:00 pm via Canvas submission

Late homework is subject to a penalty of two points per minute late.

Reading: McClellan, Schafer and Yoder, *Signal Processing First*, 2003, Sec 1.1 to 3.1.
Companion Web site with demos and other supplemental information: http://dspfirst.gatech.edu/
Web site contains solutions to selected homework problems from *DSP First*.

The e-mail address for Mr. Houshang Salimian (TA) is salimian.houshang@gmail.com.
Office hours for Mr. Salimian and Prof. Evans during the week of Sept. 3rd follow:

Time Slot	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
11:00 am	*LABOR DAY HOLIDAY*	**Salimian (EER 0.814 Table #4)**		**Salimian (EER 0.814A)**	
11:30 am		**Salimian (EER 0.814 Table #4)**		**Salimian (EER 0.814A)**	
12:00 pm		**Salimian (EER 0.814 Table #4)**		**Salimian (EER 0.814A)**	**Salimian (EER 0.814D)**
12:30 pm		Evans (EER 1.516)		Evans (EER 1.516)	**Salimian (EER 0.814D)**
1:00 pm		Evans (EER 1.516)		Evans (EER 1.516)	**Salimian (EER 0.814D)**
1:30 pm		Evans (EER 1.516)		Evans (EER 1.516)	**Salimian (EER 0.814D)**
2:00 pm		Evans (EER 6.882)		Evans (EER 6.882)	
2:30 pm		Evans (EER 6.882)		Evans (EER 6.882)	
3:00 pm		Evans (EER 6.882)	**Salimian (EER 1.810)**	Evans (EER 6.882)	
3:30 pm			**Salimian (EER 1.810)**		
4:00 pm			**Salimian (EER 1.810)**		
4:30 pm					

Prof. Evans is holding coffee/advising hours on Fridays 12-2pm at the EERC café during the fall semester from Aug. 31st to Dec. 7th inclusive except Nov. 23rd (due to the Thanksgiving Holidays).

Feel free to stop by on Aug. 31st if you're in town.

1. Finding Parameters of a Sinusoidal Waveform from a Plot. 20 points.

Signal Processing First, problem P-2.2, page 31, but use the plot below instead of the plot in Fig. P-2.2:
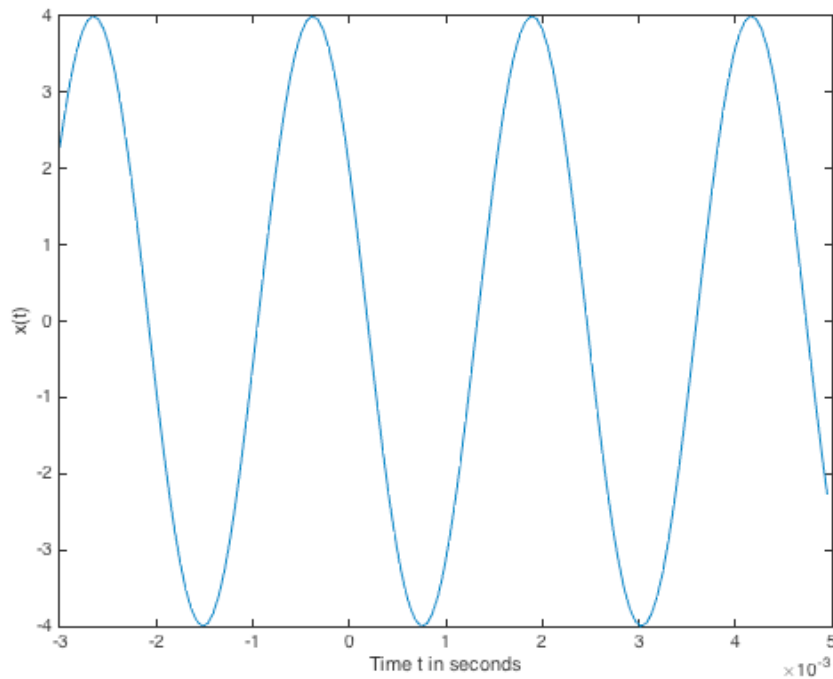
2. Using Phasors. 20 points.

Signal Processing First, problem P-2.9, page 32. Please complete all parts. In addition, for part (b), please write and submit the MATLAB code to plot the signal $x(t)$.

3. Complex Exponential Signal. 20 points.

Signal Processing First, problem P-2.13, page 33. For part (a), simplify the expression for $s_1(t)$ and write and submit MATLAB code to plot $s_1(t)$. Same goes for part (b) with respect to $q(t)$.

4. Difference Equation. 20 points.

Signal Processing First, problem P-2.20, page 34. In addition, validate your answer by computing in MATLAB several values of the difference equation and the closed-form answer for $y[n]$. Submit your MATLAB code.

5. Sum of Sinusoidal Signals. 20 points.

Signal Processing First, problem P-3.5, page 65. You may plot the spectrum in part (c) by hand. There is no requirement to use MATLAB for this problem.

As stated on the course descriptor, "Discussion of homework questions is encouraged. Please be sure to submit your own independent homework solution."

NOTE: In your solutions, please put all work for problem 1 together, then all work for problem 2 together, etc. Please follow the other guidelines for your solutions on the homework page.