

University of Portland School of Engineering

EE 262
Spring 2017
A. Inan

Homework # 6 – MATLAB # 1 (Assigned: Friday, March 24, 2017) (Due: Monday, April 3, 2017, 9:15a.m.)

1. Write a MATLAB program to generate and sketch the sinusoidal signals given by

(a) $x_1(t) = 10 \sin(0.5\pi t - \pi/6)$

(b) $x_2(t) = 10 \cos(0.2\pi t + 2\pi/3)$

Sketch $x_1(t)$ for the time interval $-10 \leq t \leq 10$ and use $-20 \leq t \leq 20$ for the sketch of $x_2(t)$.

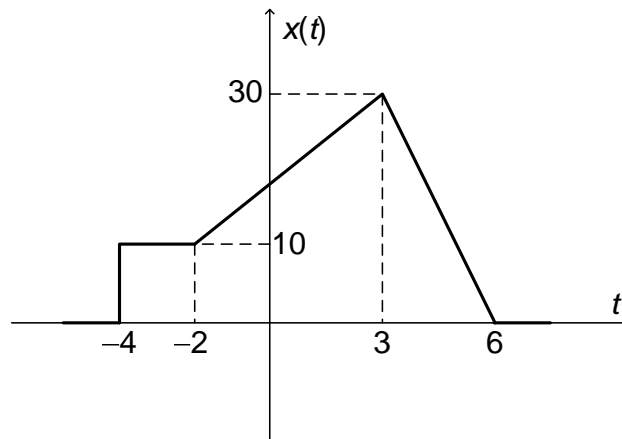
2. Write a MATLAB program to generate and sketch the sinusoidal signals given by

(a) $x_1(t) = 5e^{-2t} \cos(10\pi t) u(t)$

(b) $x_2(t) = 5e^{2t} \cos(10\pi t) u(t)$

Use the time interval $0 \leq t \leq 1$ for each sketch.

3. For the signal $x(t)$ shown:



Write a MATLAB program to find and sketch the following signals:

(a) $x_1(t) = (1/5)x(2 - t)$

(b) $x_2(t) = x(2t - 4)$

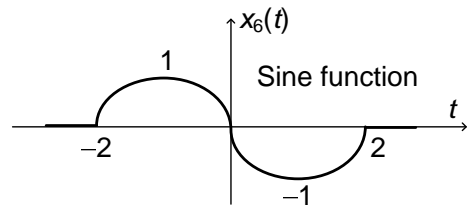
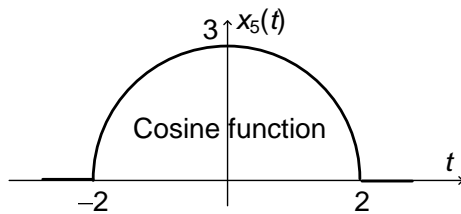
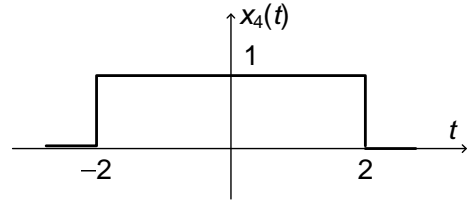
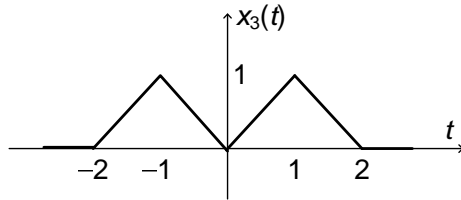
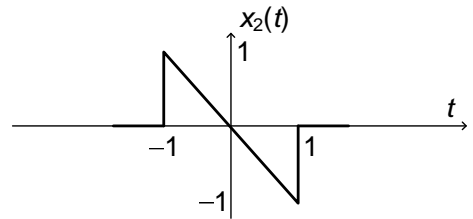
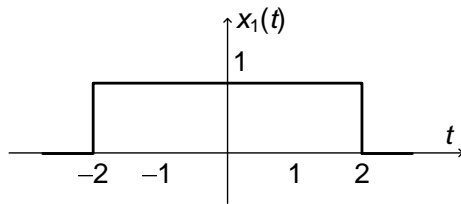
(c) $x_3(t) = x(t/2 - 1)$

(d) $x_4(t) = (1/2)x(-2t + 2)$

- (e) $x_e(t)$ (even part of $x(t)$)
- (f) $x_o(t)$ (odd part of $x(t)$)

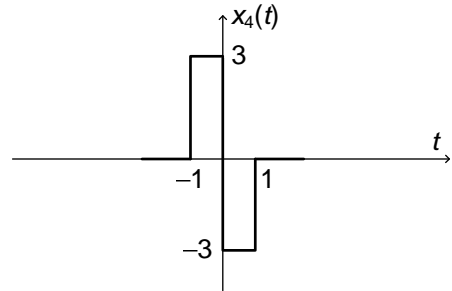
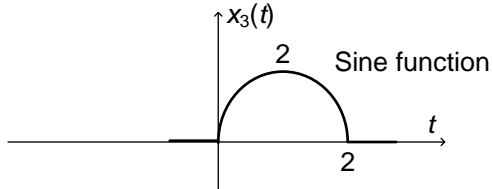
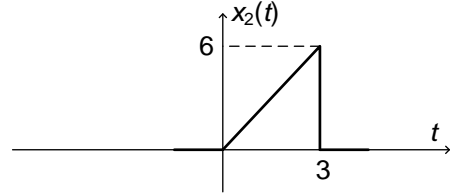
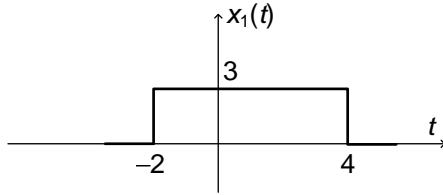
4. Write a MATLAB program to find and sketch the following convolution integrals:

- (a) $y_1(t) = 2u(t) * u(t - 2)$
- (b) $y_2(t) = 2r(t) * 3u(t - 1)$
- (c) $y_3(t) = [u(t) - 2r(t)] * [2\delta(t) - 3u(t - 1)]$
- (d) $y_4(t) = 2r(t) * 3r(t)$
- (e) $y_5(t) = x_1(t) * x_2(t)$
- (f) $y_6(t) = x_3(t) * x_4(t)$
- (g) $y_7(t) = x_5(t) * x_6(t)$ (Note that both signals are zero for $t \leq -2$ and $t \geq 2$)



5. Write a MATLAB program to find and sketch the following convolution integrals:

- (a) $y_1(t) = x_1(t) * x_2(t)$
- (b) $y_2(t) = x_3(t) * x_4(t)$



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Please use the following guidelines for your homework solutions:

- 1) On the first sheet, at the top center, write: Homework #6-Solutions.
- 2) Provide your full name on the upper right corner of the first sheet.
- 3) Also write: EE 262/Spring 2017 on the upper left corner of the first sheet.
- 4) Solve each problem on a separate sheet unless your solution is very short.
- 5) Box all of your answers.
- 6) Staple your solutions in the above order before you turn them in.

Please turn in your homework on time.

Important reminder:

EE 262-Midterm Exam # 2 is on Friday, April 7, 2017, 9:15-10:10a.m.
Closed book exam, only 2 to 3 formula sheets are allowed.