

Relevant lectures: 1/23, 1/25, 1/28.

Relevant reading: Chapter 2 -- all, Appendix A -- all.

Relevant items in the DSP First CD: Homework Problems: 2.2-2.26, 2.48-2.52.

Homework submission policies: Same as before, listed at the end of this assignment.

- Convert each of the following complex numbers to complex exponential form. Do them by hand, and check them with a calculator. Your answers may contain π and/or squareroots, or you may eliminate such terms -- your choice.

(a) $z = \sqrt{2} + j\sqrt{2}$

(b) $z = -1 + j\sqrt{3}$

(c) Sum the two numbers and express the answer in rectangular and exponential forms. Do this by hand and check your answer with a calculator. Your answer may contain π and/or square roots, or you may eliminate such terms, as you wish.

(d) Multiply these two numbers and express the answer in rectangular and exponential forms. Do this by hand and check your answer with a calculator. Your answer may contain π and/or squareroots, or you may eliminate such terms -- your choice.

- Convert each of the following complex numbers to rectangular form. Do them by hand, check them with a calculator. Your answers may contain π and/or square roots, or you may eliminate such terms, as you wish.

(a) $3 e^{j\pi/4}$

(b) $2 e^{-j5\pi/6}$

- A.3, p. 398, from the text. Do by hand. (Hint: Exponential form.)

- 2.5 (b), p. 44 (*derive trig identity from Euler*)

- 2.7 (c,e), p. 44 (*simplify complex-valued expressions*)

- 2.8, p. 44 (*from Matlab code, derive formula for signal and sketch it*)

- 2.9 (a), p. 45 The phase angles in your expressions should be in radians. Use the method shown in the book and in lecture. (*simplify sum of sines and find complex exponential signal*)

- 2.10, p. 45 (the phase angle should be expressed in radians)
(*use phasors to find sum of three sinusoids*)

- Express the following signal in standard sinusoidal form.

$$\sqrt{3} \cos(50t + \pi^2) - 6.7 \cos(50t - \sqrt{3})$$

(You'll need a calculator.)

Homework submission policies are on the next page.

(use phasors to find sum of three sinusoids)

Homework submission policies:

Write neatly and legibly. The graders will not grade papers that are illegible or difficult to read.

Clearly write your name, lecture session number, and lab session number at the top of your paper. (We will return homework by Lab section number.)

Underline your "last" name as it appears in University records.

Submit the problems in the assigned order.

For each problem, list the problem number and the textbook number, if it comes from the textbook.

Staple your paper in the upper left corner.

Hand in your homework just before or just after lecture on the due date. (Please don't disturb a lecture in progress.)

If you need an extension, you may place your homework in the box outside Room 4234 EECS before 4:30 PM of the date it is due.

Homework will not be accepted after 4:30 PM on the due date, except in extenuating circumstances such as illness, and only when approved by Professor Lafortune or Neuhoff.

Not all problems in all homework assignments will be graded. (We'll grade as many as possible.) However, solutions will be given to all problems.

The lowest homework grade of the semester will be dropped.

Honor Code/Collaboration Policy:

See the policy described in the first day handout, which is posted on the class website.