

**Homework Assignments (preliminary)**

**Homework set # 1, due Fri. Jan. 8**

Problem 3.3

Problem 3.4

Problem 3.7

**Homework set # 2, due Thurs. Jan. 14**

Problem 3.31

Problem 3.30

Problem 3.37

Problem 3.54

**Homework set # 3, due Thurs. Jan. 21**

Problem 3.42

Problem 3.44

Problem 3.52

The following three problems are taken from the handout on contour integration, Oppenheim and Schaffer 1st edition.

Problem 4.36 a), d), e), 1st ed.

Problem 4.38, 1st ed.

Problem 4.40, 1st ed.

**Homework set # 4, due Jan. 28**

From your third ed. text:

Problem 4.15

Problem 4.31

Problem 4.35

Problem 4.58

Problem 4.65

**Homework set # 5, due Mon. Feb 8**

Problem 8.3

Problem 8.17

Problem 8.55

(note this is the basis for developing the FFT in the next chapter)

Problem 8.10

Extension part b) Consider using each of the two sequences as the impulse response for a lowpass filter. Discuss which would perform better in this roll, and explain why. As part of your analysis, compute the DFT to approximate the DTFT (i.e. zero pad to a longer DFT size) of the two sequences (MATLAB FFT function, calculator, or other computed solution acceptable) and explain why these numerical results support your conclusion.

Problem 8.66

Problem 8.67

**Homework set # 6, due Thurs. Feb 11**

Problem 9.1

Problem 9.17

Problem 9.18

Problem 9.39

Problem 9.37

Problem 9.27

**Homework set # 7, due Feb 18**

Problem 9.60 (Refer to lecture notes)

Using MATLAB write a subroutine for computing an  $N$  point FFT recursively. Do not use the built in FFT functions. Assume  $N$  is a power of 2. Submit your source code listing and output data for an input signal of:

$$x[n] = \cos \frac{n\pi}{4}, \quad 0 \leq n \leq 31.$$

Problem 5.17

**Homework set # 8 due Feb. 25**

Problem 5.54

Problem 5.28

Given two minimum phase sequences,  $h_1[n]$  and  $h_2[n]$ , is  $h_1[n] * h_2[n]$  minimum phase? Prove your conclusion.

Problem 5.15

**Homework set # 9 due Mon. Mar. 8**

Problem 5.44. Do not actually compute the magnitude frequency responses for these sequences. Select your answers based on known properties of such systems.

Problem 5.57

Problem 7.23

Problem 7.2

Problem 7.3

**Homework set # 10 due Mon. Mar. 15**

Problem 7.25

Problem 7.26

Problem 7.43

Problem 7.5

Also, use MATLAB to compute the impulse response using windowed filter design techniques.

Problem 7.6

**Homework set # 11 due Mon. Mar. 22**

Problem 7.34

Also, use MATLAB to compute the impulse response and frequency response using `remez` (the Parks - McLellan algorithm) and `freqz`.

Problem 7.63

Also, use MATLAB to compute the impulse response and frequency response using `remez` (the Parks - McLellan algorithm) and `freqz`.

Problem 7.61

Problem 7.59

**Homework set # 12 due Fri. Mar. 26**

Problem 7.57

Problem 12.1