Reading Assignments:

Read Chapter 3.7, 3.8 of Chen and Matlab Notes

Computer Assignments:

1) Use Matlab to plot y versus t with t=0:0.01:5 and y defined as
   \[ y = 3e^{-4t} \cos(5t) - 2e^{-3t} \sin(2t) + \frac{t^2}{t+1} \]

2) Given two polynomials:
   \[ f(x) = x^5 - 3x^4 + 5x^2 + 7x + 9 \]
   \[ g(x) = 2x^6 - 8x^4 + 4x^2 + 10x + 12 \]
   Find all the solutions to the equation
   \[ f(x)g(x) = 0 \]

3) We have seen the aliasing effect visually during lecture. In this problem, you are asked to explore the aliasing effect in audio. Download the MATLAB script aliasing_demo_audible.m from the homework webpage and run it. You will hear six tones at different frequencies: 500Hz, 2kHz, 3kHz, 4.5kHz, 5.5kHz and 7kHz. All the signals are sampled at 5kHz. Explain what you hear based on the perceived pitch.

Paper and Pencil Assignments:

1) Problem 3.14: Consider the positive feedback system show below. Find its impulse response.

   ![Diagram of positive feedback system with unit time delay element](image)
2) Problem 3.15: Compute the integral convolution of \( h_1(t) \) and \( u_1(t) \), shown below.

![Graph of h1[n] and u1[n]](image1)

![Graph of h2[n] and u2[n]](image2)

3) Problem 3.18: Find a differential equation to describe the following network.

![Network diagram](image3)