Assignment - 1

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Abstract—This document contains the solution to Exercise 3.43 (c) of Oppenheim.

Problem 1. When the input to an LTI system is

$$x[n] = \left(\frac{1}{2}\right)^n u[n] + 2^n u[-n-1], \qquad (1)$$

the output is given by

$$y[n] = 6\left(\frac{1}{2}\right)^n u[n] - 6\left(\frac{3}{4}\right)^n u[n]. \qquad (2)$$

(c) Write the difference equation that charachterizes the equation.

Solution:

$$y[n] - \frac{3}{4}y[n-1] = x[n] - 2x[n-1] \qquad (3)$$