

Indian Institute of Science

E9–252: Mathematical Methods and Techniques in Signal Processing

Instructor: Shayan G. Srinivasa

Homework #3, Fall 2017

Late submission policy: Points scored = Correct points scored  $\times e^{-d}$ ,  $d = \#$  days late

Assigned date: Sept. 11<sup>th</sup> 2017

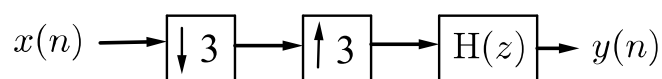
Due date: Sept. 18<sup>th</sup> 2017 by end of the day

**PROBLEM 1:**

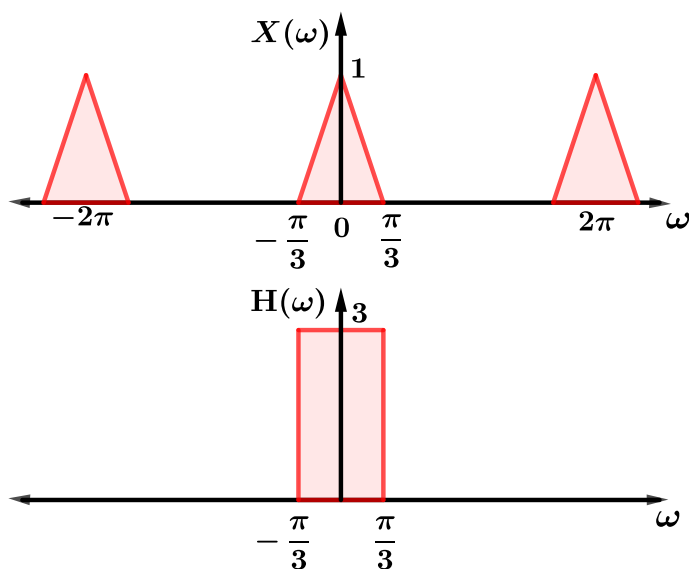
Solve problems 4.6 and 4.11 from P. P. Vaidyanathan's book.

**PROBLEM 2:**

Consider the following system:



Suppose the spectrum of the original signal and transfer function is:



Analyze the spectrum of  $y(t)$ . Analyze the output spectrum if the decimator and expander and interchanged.