EECS20n, Quiz 4

The quiz will take 15 minutes. Write your reponse on the sheet. Note that there are problems on both sides of this paper. Please print your name and lab time here:

Last Name _____ First _____ Lab time _____

1. Consider a discrete-time signal x given by

$$\forall\, n \in \textit{Integers}, \quad x(n) = \sum_{k=-\infty}^{\infty} \delta(n - 2k),$$

where δ is the Kronecker delta function. Sketch this signal.

2. For the same signal as in the previous problem, find the Fourier series coefficients X_k in

$$x(n) = \sum_{k=0}^{p-1} X_k e^{i\omega_0 k n}.$$

3. Consider a discrete-time LTI system with frequency response H given by

$$\forall\, \omega \in Reals, \quad H(\omega) = |sin(\omega/2)|.$$

Sketch this over one period.

4. Suppose the signal in problem 1 is the input to the system in problem 3. Find the output y and sketch it. ("Find" means give an expression for $y(n)$ that is valid for all integers n).