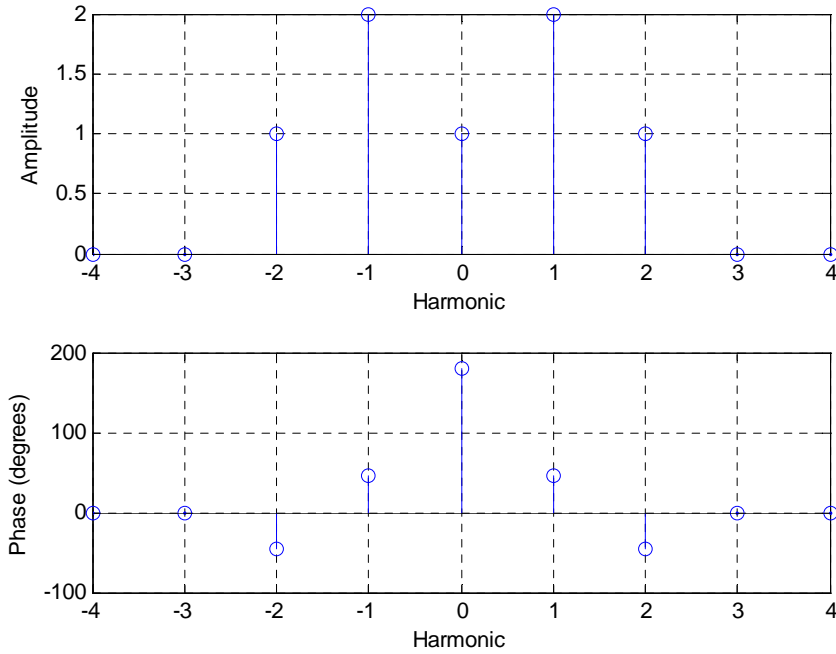ECE-300, Quiz #5

Problems 1, 2, and 3 refer to the following plot (all angles are multiples of 45 degrees)

1) Is this a valid spectrum plot for a real valued function $x(t)$?

a) Yes   b) No

2) What is the average power in $x(t)$?

a) 4 W   b) 7 W   c) 11 W   d) 12 W
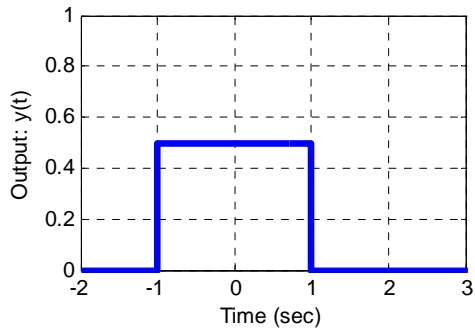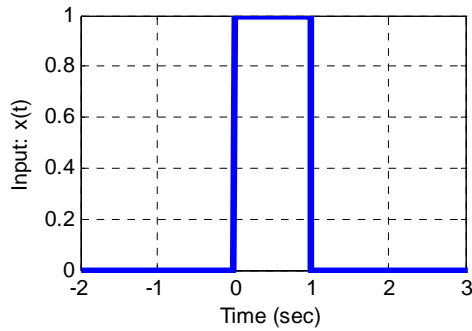
3) The average value of $x(t)$ is

a) 1   b) 2   c) $\dfrac{7}{4}$ d) -1

4) Assume we are going to synthesize a periodic signal $x(t)$ using $x(t) = \sum c_k e^{jk\omega_0 t}$

where $c_k = \dfrac{jk}{1+k^2}$. Will $x(t)$ be a real function?

a) Yes   b) No

Problems 5 and 6 refer to a particular (but unknown) LTI system. If the input to the LTI system is $x(t)$, shown below on the left, the output of the system is $y(t)$, shown below on the right.

5) Is this system causal?   A) Yes   B) No

6) Assume we have a new input to the system, $x_{new}(t)$,   shown below in the top left. Which of the following functions corresponds to the output of the system with this new input?

a) $y_1(t)$ b) $y_2(t)$ c) $y_3(t)$ d) $y_4(t)$