ECE 312 HW#5

① suppose the impulse response for a LTI system is

$$h[0] = 1$$
$$h[1] = -0.5$$
$$h[2] = 0.22$$
$$h[3] = -0.1$$
$$h[4] = 0.07$$
$$h[n] = 0 \quad \forall \; n \geq 5$$

the input to the LTI system is

$$x[0] = 1$$
$$x[1] = 0.5$$
$$x[2] = 0.5$$
$$x[n] = 0 \quad \forall \; n \geq 3$$

find $y[n]$ where

for $n = 0, 1, 2, \ldots, 10$

(2) find $y[n]$ $\forall n \geq 0$
for the system in problem 1
if $x[n] = u[n]$

(3) A LTI system is governed by

$$y[n] = x[n] + 0.5\,y[n-2] - 0.2\,y[n-3]$$

draw a block diagram of
this system

(4) Assume $x[n] = \underset{\uparrow}{1}, \underset{\uparrow}{1}, 0, 1, 1, 0, \ldots$
$n=0$ $n=1$ . . . . . .

(a) compute the $X[k]$'s using a DTFS

(b) " " " " " DFT

(your series exactly
reproduces $x[n]$)
you must verify both of

(5) A LTI system has the governing difference equation

$$y[n] - 0.4\,y[n-1] = 2x[n-1]$$

plot the frequency response (magnitude only) of this system.