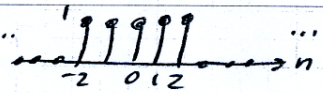
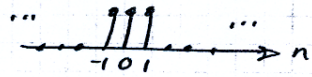
① Text 7-26

$$g[n] = \text{rect}_2[2n] * (\delta[n-1] - 2\delta[n-2]) \qquad g[2] = ?$$

$\text{rect}_2[n]$:



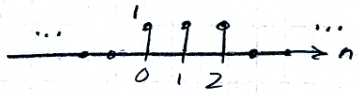
$\underbrace{\text{rect}_2[2n]}_{\text{let's call this } x[n]}$:



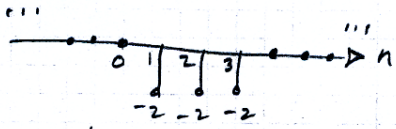
$$g[n] = x[n] * (\delta[n-1] - 2\delta[n-2])$$

$$= x[n-1] - 2x[n-2]$$

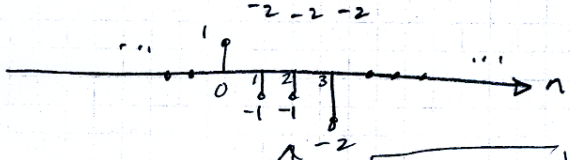
$x[n-1]$:



$-2x[n-2]$



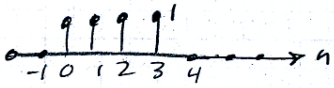
$g[n]$:



$$\boxed{g[2] = -1}$$

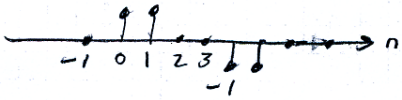
② Text, 7-3

$x[n] = u[n] - u[n-4]$:



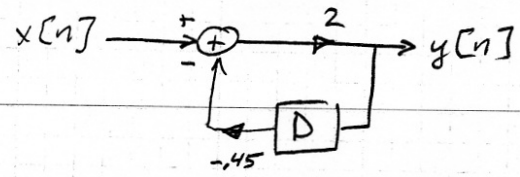
$$h[n] = \delta[n] - \delta[n-2]$$

$$x[n] * x[n] = x[n] * (\delta[n] - \delta[n-2]) = x[n] - x[n-2]$$



TOPS 35510 - 100 sheets 35520 - 200 sheets

(3) Text, 7-10



$$y[n] = 2\left(x[n] - (-.45)y[n-1]\right)$$
$$= 2x[n] + 0.9\,y[n-1]$$

index	$2x[n]=2\delta[n]$	$0.9\,y[n-1]$	$y[n]=h[n]$
-1	0	0	0
0	2	0	2
1	0	$2(0.9)$	$2(0.9)$
2	0	$2(0.9)^2$	$2(0.9)^2$
3	0	$2(0.9)^3$	$2(0.9)^3$
			$\vdots$

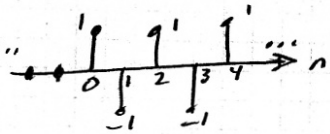
$$\boxed{h[n] = 2(0.9)^n u[n]}$$

(4) Text, 7-16

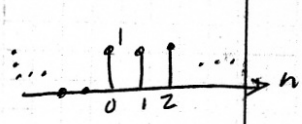
Given: input to system is ramp, output is unbounded

This provides no information on BIBO stability because to be BIBO stable, system must yield bounded outputs for all <u>bounded</u> inputs. Ramp is not bounded.

(5) $h[n]$:



$|h[n]|$:



Since $\sum_{n=-\infty}^{\infty} |h[n]| = \sum_{n=0}^{\infty} 1 = \infty$, system is <u>NOT</u> BIBO stable.