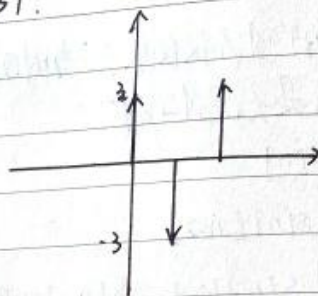
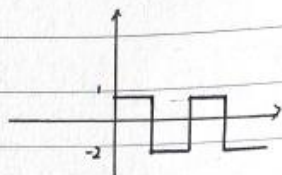


周子涵 2018011218014

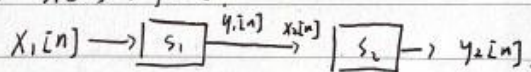
第一章 14 15 16 17 23 24 31.

14. 解:



$$g(t) = \sum_{k=-\infty}^{\infty} s(t - 2k)$$

$$\frac{dg(t)}{dt} = A_1 g(t - t_1) + A_2 g(t - t_2)$$

由导数图象得  $A_1 = 3$ ,  $A_2 = -3$ ,  $t_1 = 0$ ,  $t_2 = 1$ .15. 解:  $x[n] \rightarrow y[n]$ 

(a) 系统 S 的输入-输出关系为

$$y_1[n] = 2x[n] + 4x[n-1]$$

$$\therefore \text{输入-输出关系为 } y[n] = 2x[n-2] + 4x[n-3] + x[n-3] + 2x[n-4]$$

$$\Rightarrow y[n] = 2x[n-2] + 5x[n-3] + 2x[n-4]$$

(b) 若按  $x[n] \rightarrow S_2 \rightarrow S_1 \rightarrow y[n]$ 

$$y[n] = x[n-2] + \frac{1}{2}x[n-3]$$

$$\therefore \text{输入-输出关系为 } y[n] = 2x[n-2] + x[n-3] + 4x[n-3] + 2x[n-4]$$

$$= 2x[n-2] + 5x[n-3] + 2x[n-4]$$

 $\therefore$  系统 S 的输入-输出关系不会改变

16. 解:  $y[n] = x[n]x[n-2]$

(a)  $\because$  该系统的输出不仅仅取决于当时的输入

$\therefore$  该系统不是无记忆的.

(b)  $x[n] = A \delta[n]$

$\therefore y[n] = A^2 \delta[n]\delta[n-2]$

$\because \delta[n] = 1$  时  $\delta[n-2] = 0$  ,  $\delta[n-2] = 1$  时  $\delta[n] = 0$

$\therefore$  系统输出为 0.

(c) 输入  $A \delta[n]$  时, 系统输出为 0

输入  $A \delta[n-1]$  时, 系统输出也为 0.

$\therefore$  不同的激励产生了相同的响应.

$\therefore$  该系统不是可逆系统

17. 解:  $y(t) = x(\sin t)$

(a)  $t \quad \sin t$

$\because y(-2\pi) = x(0)$

$\therefore$  该系统不是因果的

(b) 输入的线性组合为  $a x_1(t) + b x_2(t)$

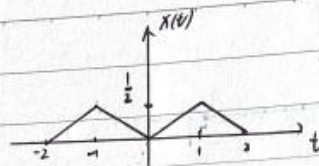
$\therefore y_3(t) = x_3(\sin t)$

$= a x_1(\sin t) + b x_2(\sin t)$

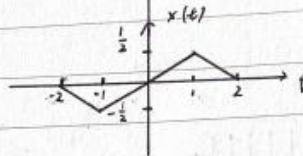
$= a y_1(t) + b y_2(t)$

$\therefore$  该系统是线性系统.

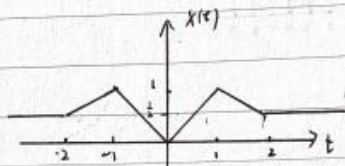
3. 解: (a) 偶部:



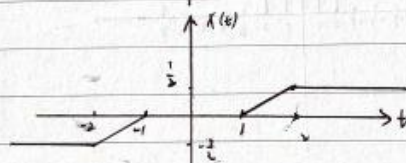
奇部:



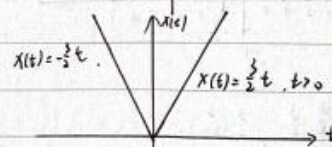
(b) 偶部



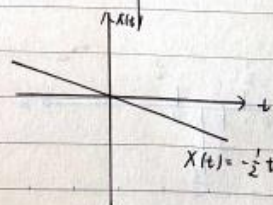
奇部



(c) 偶部:

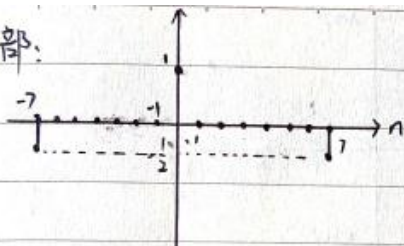


奇部:

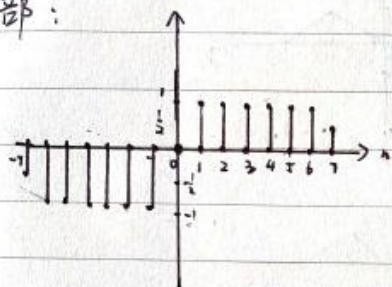




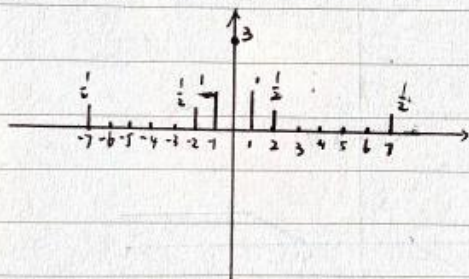
(a) 偶部:



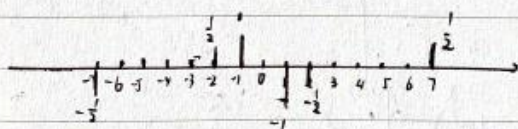
奇部:



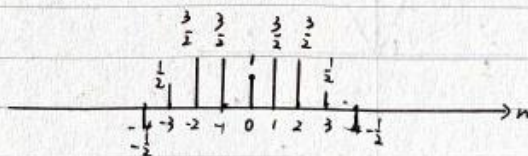
(b) 偶部



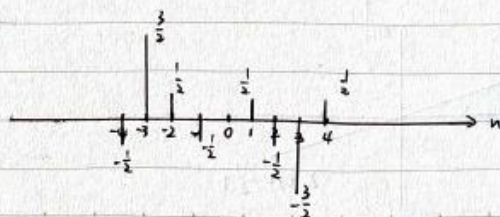
奇部



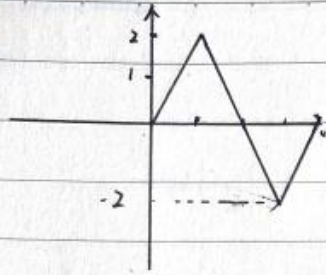
(c) 偶部:



奇部:



31. (a)



(b).

~~$-1 \leq x \leq 0, \quad x_2(t) = x_1(t+1)$~~

~~$0 \leq x \leq 1, \quad x_2(t) = 2x_1(t)$~~

~~$x \geq 1, \quad x_2(t) = x_1(t)$~~

$$x_2(t) = x_1(t) + x_1(t+1)$$

$$y_2(t) = y_1(t) + y_1(t+1)$$

