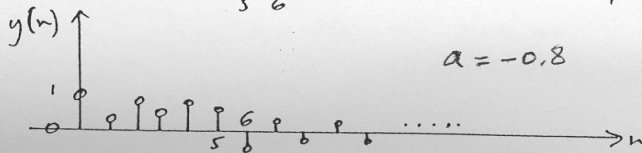
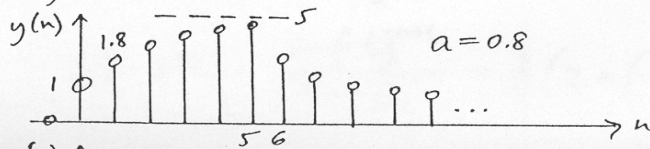
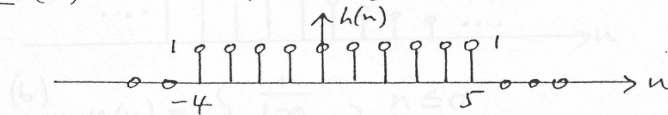


2.2 Let  $s(n) = h(n) * u(n) = \left( \frac{1-a^{n+1}}{1-a} \right) u(n)$ .

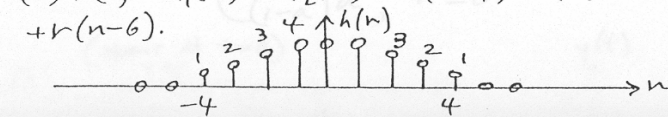
Then  $y(n) = s(n) - s(n-6)$ .



2.5 (a)  $h(n) = h_1(n) + h_2(n) = u(n+4) - u(n-6)$ .



(b)  $h(n) = h_1(n) * h_2(n) = r(n+4) - r(n) - r(n-2) + r(n-6)$ .



2.9 (a)  $|a| > 1$ . (b)  $|a| < \infty$ .

(c)  $|r| < 1$ . (d)  $|a| < 1$ .

(e)  $k = 0$  (null system).

2.14

| (a) | $\frac{A}{1}$  | $\frac{\omega_0}{\pi/2}$ | $\frac{\phi}{-\pi/2}$ |
|-----|----------------|--------------------------|-----------------------|
| (b) | $\sqrt{2}$     | $\pi/2$                  | $-\pi/4$              |
| (c) | $1/\sin \pi/3$ | $2\pi/3$                 | $-\pi/2$              |
| (d) | "              | $\pi/3$                  | "                     |
| (e) | 2              | $\pi/3$                  | $-\pi/3$              |
| (f) | 1              | $\pi$                    | $\pm \pi$             |
| (g) | $\sqrt{2}$     | $\pi/4$                  | $-\pi/4$              |
| (h) | $\sqrt{2}$     | $3\pi/4$                 | $3\pi/4$              |

2.15 (a)  $y(n) = u(n+1) - 2u(n-2)$

(b)  $y(n) = a^{n+1} [u(n+1) - u(n-1)]$

$= \delta(n+1) + a\delta(n)$

(c)  $y(n) = \frac{a^{|n|}}{1-a^2}$ , all  $n$ .

(d)  $y(n) = \delta(n+3) + \delta(n+1) + u(n-1)$