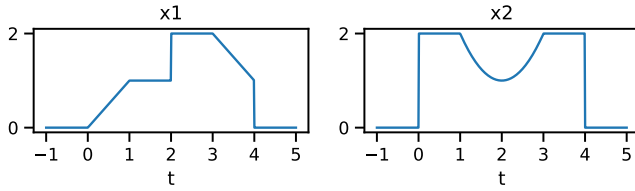


# 연속시간 신호

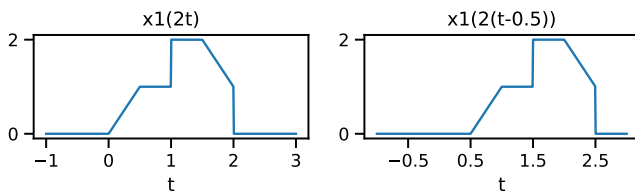
**P1.1** 구간별로 그려보면 다음과 같다.



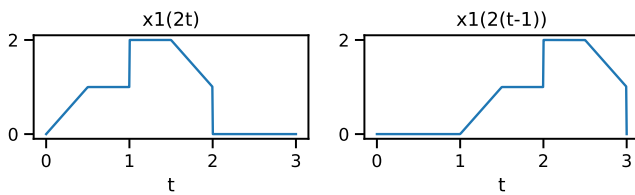
**P1.2**

$$x_1(t) = \begin{cases} (t/2)^2, & 0 \leq t < 2 \\ 3, & 2 \leq t < 4 \\ 0, & 4 < t < \infty \end{cases} \quad x_2(t) = \begin{cases} t, & 0 \leq t < 2 \\ -1, & 2 \leq t < 4 \\ 0, & 4 \leq t < \infty \end{cases}$$

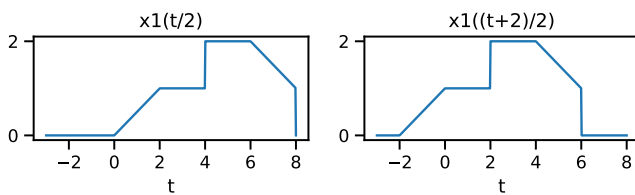
**P1.3** (a)



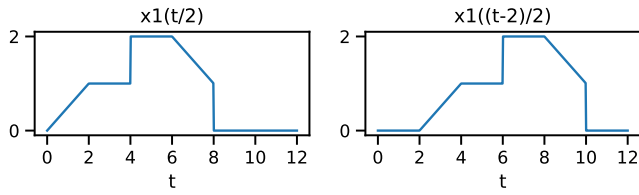
(b)



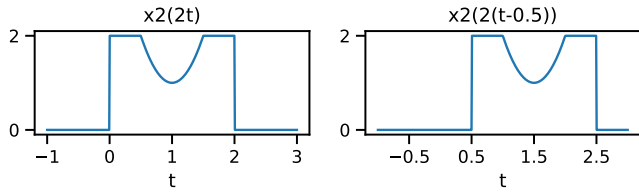
(c)



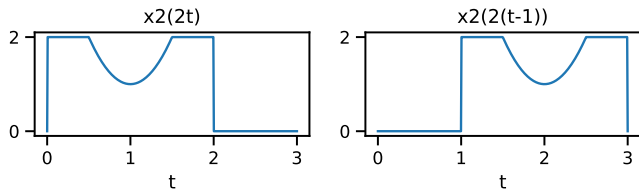
(d)



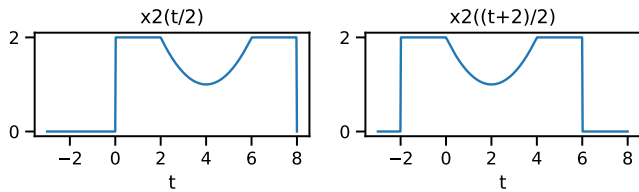
(e)



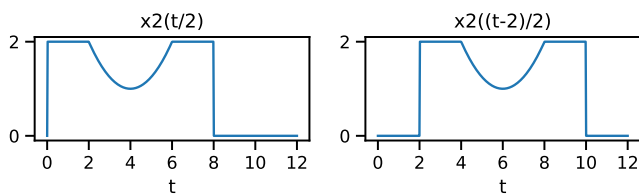
(f)



(g)



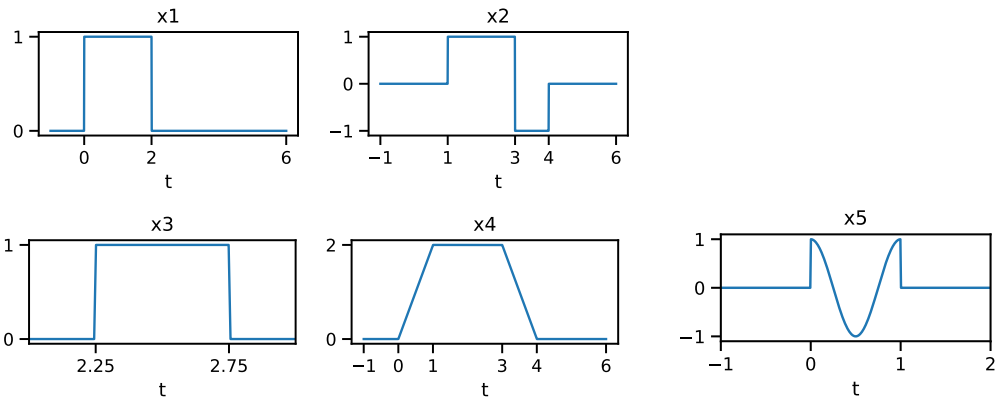
(h)



**P1.4** (a)  $x_1(t) = -u(t + 1) + 2u(t) - u(t - 1)$

(b)  $x_2(t) = u(t) + u(t - 1) - u(t - 2) - u(t - 3)$

**P1.5**

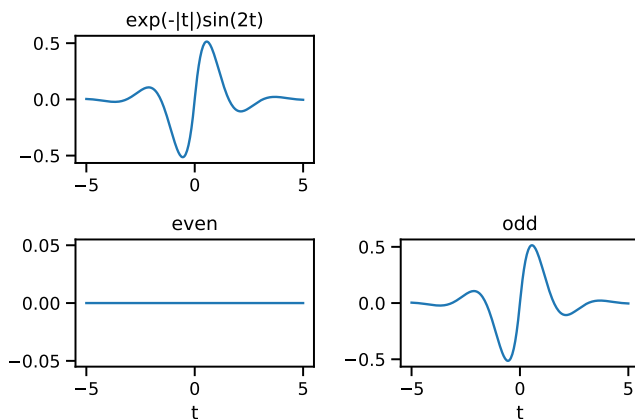


- P1.6** (a) 비주기 (b) 비주기 (c) 비주기  
 (d) 주기, 기본주파수  $f_0 = 3/2\pi$  Hz, 기본주기  $T_0 = 2\pi/3$  sec.  
 (e) 주기, 기본주파수  $f_0 = 3/2\pi$  Hz, 기본주기  $T_0 = 2\pi/3$  sec  
 (f) 주기, 기본주파수  $f_0 = 1$  Hz, 기본주기  $T_0 = 1$  sec.

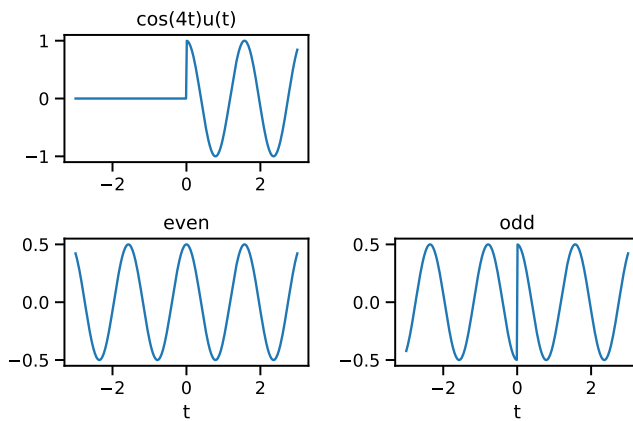
- P1.7** (a) 비주기  
 (b) 주기, 기본주파수  $f_0 = 2/\pi$  Hz, 기본주기  $T_0 = \pi/2$  sec  
 (c) 주기, 기본주파수  $f_0 = 3/2\pi$  Hz, 기본주기  $T_0 = 2\pi/3$  sec  
 (d) 주기, 기본주파수  $f_0 = 1/\pi$  Hz, 기본주기  $T_0 = \pi$  sec

- P1.8** (a) 기대칭 (b) 대칭 신호가 아님

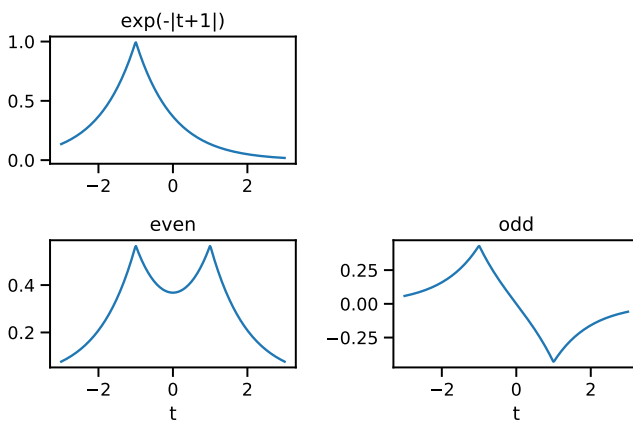
**P1.9** (a)



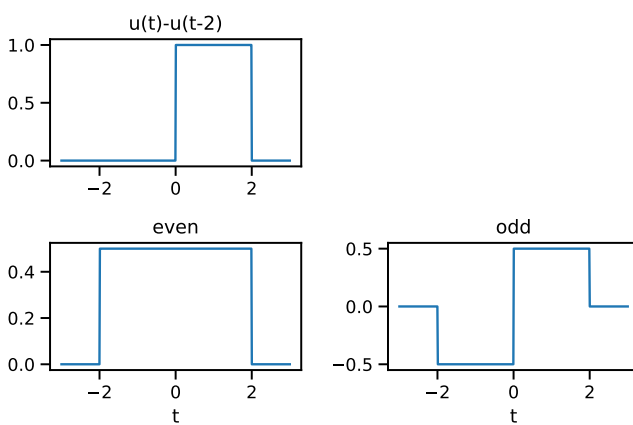
(b)



(c)



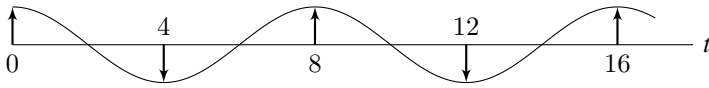
(d)



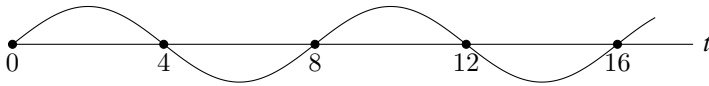
**P1.11** (a)  $y_1(t) = \cos(\pi/4)$       (b)  $y_2(t) = \frac{1}{8}$

**P1.12** (a)  $-u(t-1)$       (b)  $u(t+1) - u(t-4)$

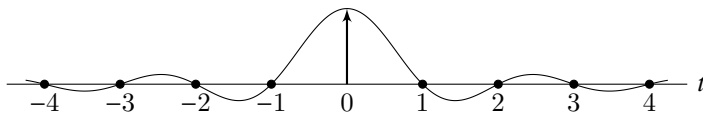
P1.13 (a)  $y(t) = \sum_{k=-\infty}^{\infty} (-1)^k \delta(t - 4k)$



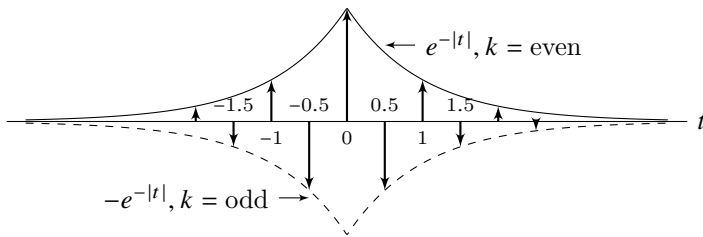
(b)  $y(t) = \sum_{k=-\infty}^{\infty} \sin(\pi k) \delta(t - 4k) = 0$



(c)  $y(t) = \delta(t)$



(d)  $y(t) = \sum_{k \text{ even}} e^{-|t|} \delta(t - k/2) + \sum_{k \text{ odd}} (-1)e^{-|t|} \delta(t - k/2)$



- P1.14 (a) 에너지 신호  $E_{x1} = 2$       (b) 에너지 신호  $E_{x2} = \frac{1}{2}[e^2 - 1]$   
 (c) 에너지 신호  $E_{x3} = \frac{3}{8}$       (d) 전력 신호  $P_{x4} = \frac{1}{4}$   
 (e) 에너지 신호  $E_{x5} = 1$       (f) 에너지 신호도 전력신호도 아니다.

P1.15 (a)  $P_x = 1$       (b)  $P_x = 2$

P1.16 (a)  $E_1 = 2$       (b)  $E_2 = 6$

P1.17  $P_{x1} = \frac{1}{2}, P_{x2} = 2$   
 $P_y = \frac{7}{2} \neq P_{x1} + P_{x2} = \frac{5}{2}$

P1.18 (a)  $P_y = P_x$       (b)  $E_y = \frac{1}{2}E_x$

P1.19 (a) 우대칭      (b) 우대칭      (c) 기대칭