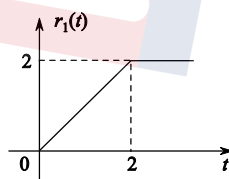
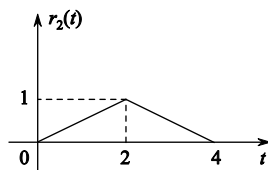


第 2 章

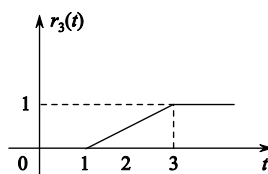
2.1 (1) $r_1(t) = 2r_0(t)$;



(2) $r_2(t) = r_0(t) - r_0(t-2)$

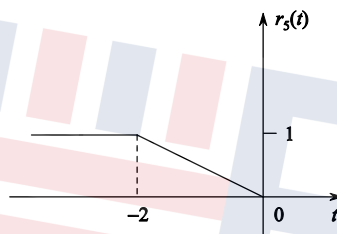


(3) $r_3(t) = r_0(t-1)$

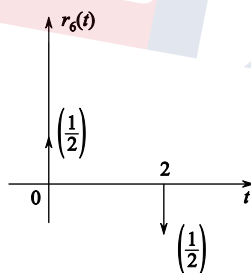


(4) 不能确定。

(5) $r_5(t) = r_0(-t)$



(6) $r_6(t) = [r_0(t)]''$



$$2.2 \quad (a) \begin{cases} 1, & t < 0 \\ 2 - e^{-t}, & t \geq 0 \end{cases}; \quad (b) [1 - \cos(t-1)]u(t-1)。$$

$$2.3 \quad t[u(t) - u(t-2)] - u(t-1) - u(t-2)$$

$$2.4 \quad \frac{1}{4}[\delta(t) - \delta(t-4)] - \delta'(t-4) + \frac{1}{4}[u(t) - u(t-4)]$$

$$2.5 \quad (1) r(t) \text{ 在 } t=0 \text{ 处无跳变, } r(0_+) = r(0_-);$$

$$(2) r(t) \text{ 在 } t=0 \text{ 处有跳变, } r(0_+) = r(0_-) + 3 = 3;$$

$$(3) r'(t) \text{ 在起始点有跳变, } r'(0_+) = r'(0_-) + 0.5 = 1.5;$$

$$r(t) \text{ 在起始时刻无跳变, } r(0_+) = r(0_-) = 1。$$

$$2.6 \quad y_{zi}(t) = 6e^{-t} - 4e^{-3t} - 5te^{-3t}, t \geq 0$$

$$2.7 \quad t^n u(t)$$

$$2.8 \quad (1) (5.5e^{-3t} + 0.5\sin 2t)u(t);$$

$$(2) 3e^{-3t}u(t) + [-e^{-3(t-t_0)} + \sin 2(t-t_0)]。$$

$$2.9 \quad \frac{1}{3}e^{2t}[e^{2t}u(-t) + e^{-t}u(t)]$$

$$2.10 \quad r(t) = [(t-1) + e^{-t}]u(t) - [(t-2) + e^{-(t-1)}]u(t-1) \\ - [(t-4) + e^{-(t-3)}]u(t-3) + [(t-5) + e^{-(t-4)}]u(t-4)$$

$$2.11 \quad (e^{-2t} - 3e^{-3t})u(t)$$

$$2.12 \quad (1) h(t) = 2\delta(t) - 6e^{-3t}u(t);$$

$$(2) h(t) = \delta'(t) + \delta(t) + e^{-2t}u(t)。$$

$$2.13 \quad t^n u(t)$$

$$2.14 \quad \frac{1}{60}t^6 u(t)$$

$$2.15 \quad \sum_{m=-\infty}^{+\infty} f(t)(t-mT)$$

$$2.16 \quad \frac{1}{\lambda}(1 - e^{-\lambda t})u(t)$$

$$2.17 \quad 6(1 - e^{-\frac{1}{3}t})u(t) + e^{-\frac{1}{4}t}u(t)$$

$$2.18 \quad \text{零输入响应 } y_{zi}(t) = \frac{3}{2}e^{-3t}, \quad t > 0$$

$$\text{零状态响应 } y_{zs}(t) = -e^{-3t} + 1, \quad t > 0$$

$$\text{全响应 } y(t) = 0.5e^{-3t} + 1, \quad t > 0$$

$$2.19 \quad \begin{cases} 0, & t < -2 \\ \frac{1}{2}(t+2), & -2 \leq t < 0 \\ 1, & 0 \leq t < 2 \\ \frac{1}{2}(4-t), & 2 \leq t < 4 \\ 0, & t \geq 4 \end{cases}$$

$$2.20 \quad h(t) = 0.5 \left(\frac{e^{-\alpha_2 t}}{L-M} - \frac{e^{\alpha_1 t}}{L+M} \right) u(t)$$

$$\text{其中, } \alpha_1 = -\frac{R}{L+M}, \alpha_2 = -\frac{R}{L-M}$$

$$2.21 \quad u_C(t) = \left[1.18e^{-\frac{3}{5}(t-3)} + \frac{10}{3} \right] u(t-3)$$

$$i_C(t) = -0.354e^{-0.6(t-3)} u(t-3)$$

$$2.22 \quad h(t) = (p^2 + 1)y_{zs}(t)$$

$$2.23 \quad u_C(t) = \frac{25}{4}e^{-t} - \frac{1}{4}e^{-5t}, \quad t \geq 0$$

$$i_L(t) = \frac{5}{4}e^{-t} - \frac{1}{4}e^{-5t}, \quad t \geq 0$$

$$2.24 \quad (1) \quad y_{zi}(t) = 2e^{-2t}u(t);$$

$$(2) \quad y_2(t) = 2\delta(t)。$$

$$2.25 \quad (-e^{-t} + 4\cos 2t)u(t)$$

$$2.26 \quad (1 + e^{-t})u(t) - u(t-1)$$