1. Escriba en término de escalones a la derecha las siguientes seáles, simplificando la expresión:

    (a)
    $$x(t) = \begin{cases} -t, & \text{si }, t < -1 \\ 1-t, & \text{si } -1 < t < 0 \\ t^2, & \text{si } 0 < t < 1 \\ 1, & \text{si } t > 1 \end{cases}$$

    (b) $x(t) = |t^2 - 4|$, $-6 < t < 6$, $t \neq 2$, $t \neq -2$

    (c) $x(t) = \text{Par}\{|t-1|\}$, $-2 < t < 2$, $t \neq 1$, $t \neq -1$

    (d)
    $$x(t) = \begin{cases} 0, & \text{si } t < -\pi \\ -\text{sen } t, & \text{si } -\pi < t < 0 \\ \text{sen } t, & \text{si } 0 < t < \pi \\ 0, & \text{si } t > \pi \end{cases}$$

    (e)
    $$x(t) = \begin{cases} 1-t^2, & \text{si } t < -1 \\ 0, & \text{si } -1 < t < 1 \\ t^2-1, & \text{si } t > 1 \end{cases}$$

2. Escriba $x(t)$ en forma explícita:

    (a) $x(t) = -t\,\mathrm{u}(-t) + (t-1)\mathrm{u}(t-1) + \mathrm{u}(t-2)$

    (b) $x(t) = \mathrm{u}(-1-t) - t\,\mathrm{u}(t+1) + \mathrm{u}(t-1)$

    (c) $x(t) = \text{Par}\left\{\left(t - \frac{\pi}{2}\right)\left(\mathrm{u}(t) - \mathrm{u}(t - \frac{\pi}{2})\right)\right\}$, $-\pi < t < \pi$

    (d) $x(t) = \cos(t)\left(\mathrm{u}(t+2\pi) - \mathrm{u}(t+\pi) + \mathrm{u}(t) - \mathrm{u}(t-\pi)\right)$, $-2\pi < t < 2\pi$

3. Calcule el período de las señales periódicas:

    $$(a) \quad x(t) = \text{sen}^2\left(\frac{2t}{3}\right) - 2\cos\left(\frac{6t}{5}\right)$$

    $$(b) \quad x(t) = 1 - \cos^3 t$$

    $$(c) \quad x(t) = 3\cos(2t)\cos^2(3t)$$

4. Halle la expresión de las siguientes señales en el intervalo $(-T/2, T/2)$ teniendo en cuenta que son señales periódias de período fundamental T:

    (a) $x(t) = |2t - 18|$, $8 < t < 10$

    (b) $x(t) = \left(\cos\left(\frac{2\pi}{3}t\right) + 2\cos\left(\frac{16\pi}{3}t\right)\right)\text{sen}(\pi t)$.

    (c) $x(t) = 2 + 3\text{sen}(2t)$, $-\frac{3\pi}{2} < t < 2\pi$

    (d) $x(t) = 3 + 2\cos(3t)$, $-\frac{\pi}{2} < t < \pi$

    (e) $x(t) = \text{Par}\left\{(t - \frac{\pi}{2})(\mathrm{u}(t) - \mathrm{u}(t - \frac{\pi}{2}))\right\}$, $-\pi < t < \pi$

(f) $x(t) = \text{Par}\{(t - \pi)(u(t) - u(t - \pi))\}, \quad -2\pi < t < 2\pi$

(g) $x(t) = \text{Par}\{|t - 1|\}, \quad -2 < t < 2$

(h) $x(t) = \text{Impar}\{|t - 1|\}, \quad -2 < t < 2$

(i) $x(t) = |\cos(3t)|, \quad -\frac{\pi}{2} < t < \pi$

(j) $x(t) = \cos t \, (u(t + 2\pi) - u(t + \pi) + u(t) - u(t - \pi)), \quad -2\pi < t < 2\pi$

(k) $x(t) = \cos^3(9t), \quad -\frac{3\pi}{2} < t < 2\pi$

(l) $x(t) = u(t), \quad -1 < t < 1$

(m) $x(t) = |\text{sen } t|, \quad -\frac{\pi}{2} < t < \frac{\pi}{2}$

(n) $x(t) = \text{sen } t, \quad -\frac{\pi}{2} < t < \frac{\pi}{2}$

(o) $x(t) = \text{sen } t, \quad 0 < t < \frac{\pi}{2}$

(p) $x(t) = \text{sen } t \, \left(u(t - \frac{\pi}{2}) - u(t - \pi)\right), \quad \frac{\pi}{2} < t < \frac{3\pi}{2}$

(q) $x(t) = \text{sen } t, \quad 4\pi < t < 12\pi.$

(r) $x(t) = \text{Impar}\{|t^2 + 2t|\}, -4 < t < -1.$