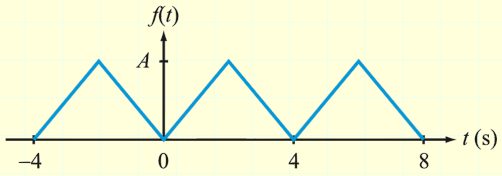
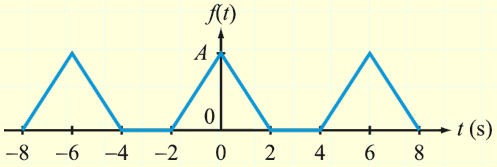
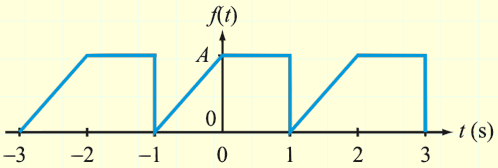
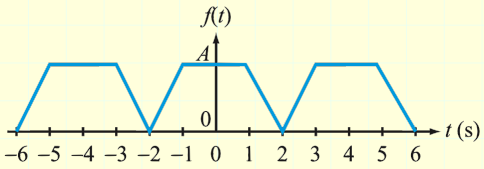
Problem 5.19 :

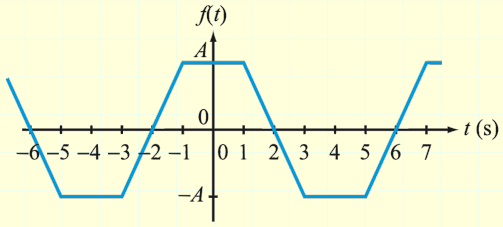
Given: The figures below

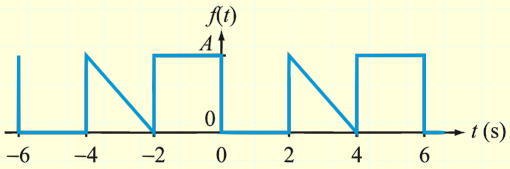








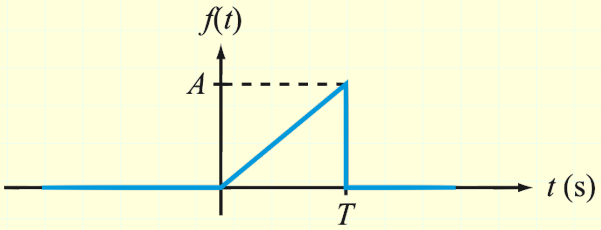




Find: Which of the waveforms above will exhibit the Gibbs oscillation phenomenon when represented by a Fourier series? Why?

Problem 5.39 :

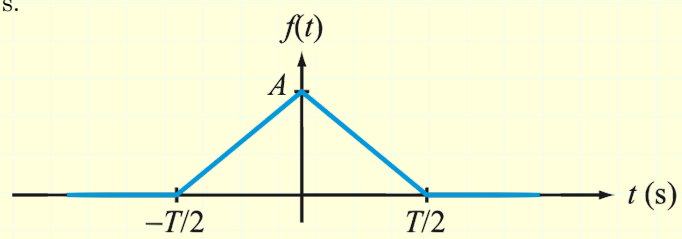
Given: $A = 5$ and $T = 3$ s.



Find: Determine the Fourier transform.

Problem 5.40 :

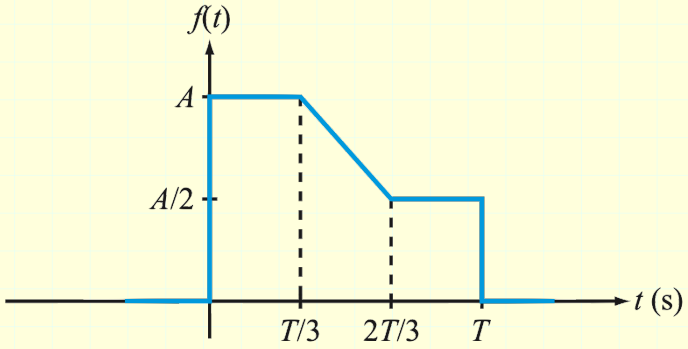
Given: $A = 10$ and $T = 6$ s.



Find: Determine the Fourier transform.

Problem 5.42 :

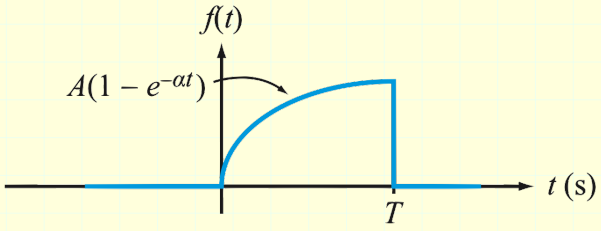
Given: $A = 2$ and $T = 12$ s.



Find: Determine the Fourier transform.

Problem 5.46 :

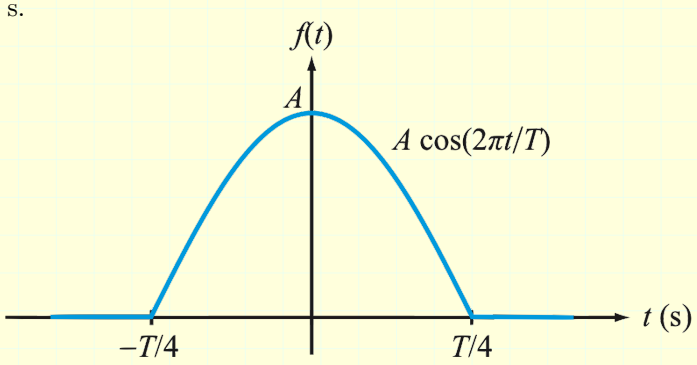
Given: $A = 5$, $T = 1$ s, and $\alpha = 10\ s^{-1}$.



Find: Determine the Fourier transform.

Problem 5.47 :

Given: $A = 10$ and $T = 2$ s.



Find: Determine the Fourier transform.

Problem 5.50 :

Given:

a. $f(t) = e^{-\alpha t}\sin(\omega_1 t)\cos(\omega_2 t)u(t)$

b. $g(t) = te^{-\alpha t}, \quad 0 \le t \le 10\alpha$

Find: the Fourier transform of the following signals with $\alpha = 0.5\ s^{-1}$, $\omega_1 = 4\text{rad}/s$, and $\omega_2 = 2\text{rad}/s$

Problem 5.66 :

Given:

$$\int_{-\infty}^{\infty} \frac{\sin^2(at)}{(\pi t)^2} dt = \frac{a}{\pi} \tag{1}$$

Find: Show the above is true if $a > 0$.