1. Let the impulse response for a LTI system be \( h(t) = e^{-at}q(t) \), with \( a > 0 \). Compute the output \( y(t) \), \( t \geq 0 \), by the convolution integral if the input is \( u(t) = q(t) - q(t - T) \), for \( T > 0 \).

2. Let the impulse response of a LTI system be \( h(t) = q(t) - q(t - T_1) \), for some \( T_1 > 0 \). The input to the system is \( u(t) = q(t) - q(t - T_2) \), with \( T_2 > T_1 \). Compute the output \( y(t) \) for \( t \geq 0 \) using the convolution integral.

3. Find the Fourier series coefficients for the signal

\[ x(t) = 5 + 2 \sin(2.1t) - 4 \cos(1.4t) + 2 \cos(2.8t) \]

4. Let

\[ x(t) = \sum_{k=\infty}^{\infty} p(t - kP) \]

where \( P \) is the period of the signal and \( p(t) = q(t) - q(t - T) \), with \( T < P \). Find the Fourier series coefficients \( C_m \) for this signal.

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5. Let the impulse response of a LTI system be \( h(t) = e^{-at}q(t) \), with \( a > 0 \). Compute the output \( y(t) \), \( t \geq 0 \), by the convolution integral if the input is \( u(t) = e^{-bt}q(t) \), for \( a \neq b \).

6. Plot the \( y(t) \) from part (5) for \( 0 \leq t \leq 10 \) with:

   (a) \( a = 0.1 \) and \( b = 1 \).
   (b) \( a = 1 \) and \( b = 0.5 \).

   (You can use MATLAB or Excel or a similar tool to do this plot.)