1. Evaluate the following discrete-time convolution
   
   (a) \( y[n] = \frac{1}{4} u[n] * u[n + 2] \)
   
   (b) \( y[n] = (-1)^n * 2^n u[-n + 2] \)
   
   (c) \( y[n] = \beta^n u[n] * \sum_{m=0}^{\infty} \delta[n - 4m] \)

2. Evaluate the following continuous-time convolution
   
   (a) \( y(t) = e^{-\gamma t} u(t) * (u(t + 2) - u(t)) \)
   
   (b) \( y(t) = e^{-\gamma t} u(t) * e^{\beta t} u(-t) \)
   
   (c) \( y(t) = e^{-\gamma t} u(t) * \sum_{m=0}^{\infty} \frac{1}{4}^m \delta(t - m) \)

3. Consider the discrete-time signals depicted in Fig. 1. Evaluate the following convolution sums:

4. Consider the continuous-time signals depicted in Fig. 2. Evaluate the following convolution integrals:
Figure 2: Figures for the continuous time signals to be used in problem 4

(a) \( m(t) = x(t) \ast y(t) \)
(b) \( m(t) = x(t) \ast z(t) \)
(c) \( m(t) = y(t) \ast w(t) \)
(d) \( m(t) = z(t) \ast f(t) \)

5. For each of the following impulse responses, determine whether the corresponding system is memoryless, causal, stable

(a) \( h(t) = \cos(\pi t) \)
(b) \( h(t) = e^{-2t}u(t-1) \)
(c) \( h[n] = \cos\left(\frac{\pi}{8}\right)\{u[n] - u[n-10]\} \)
(d) \( h[n] = \sum_{p=-1}^{\infty} \delta[n - 2p] \)