1. Use MATLAB to plot the following signals given in Homework 1. Scale your time axis so that a sufficient amount of the signal is being plotted. Use subplot to give 4 plots per page; label your plots with 'Time (sec)' on the x-axis for the continuous time signals and 'n' for discrete time signals. The y-axis should be labeled 'x(t)' or 'x[n]'; the title should be the problem number, for example '1 a'):

a) \( x(t) = 4 \cos(5\pi t - \frac{\pi}{4}) \)

b) \( x[n] = 4 \cos(\pi n) \) (Use the command stem to plot discrete-time signals.)

c) \( x[n] = 2\sin(3n) \)

d) \( x(t) = \cos(4t) + 2\sin(8t) \)

e) \( x(t) = 3\cos(4t) + \sin(\pi t) \)

f) \( x(t) = \begin{cases} 
0 & \text{if } t < -4 \\
t + 2 & \text{if } -4 \leq t < 3 \\
t - 2 & \text{if } 3 \leq t 
\end{cases} \)

2. Give an expression for the signal:

3. Determine if the following systems are time-invariant, linear or causal:

a)

\[ \frac{dy}{dt} + 4y(t) = 2x(t) \]

b)

\[ y[n] + 2y[n - 1] = x[n + 1] \]

c) \( y(t) = \sin(x(t)) \)