

KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS
ELECTRICAL ENGINEERING DEPARTMENT

EE370

Quiz #1

Name: Solution

ID#:

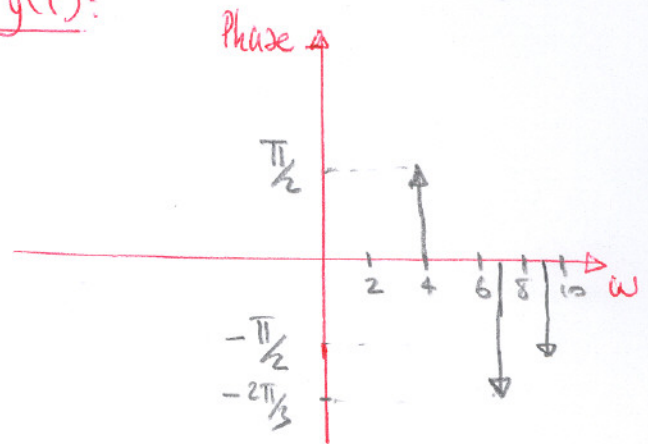
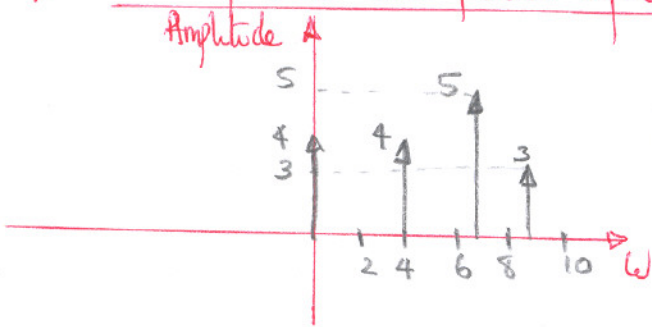
Q1: A periodic signal $g(t)$ is expressed by the following series:

$$g(t) = 4 + 4 \cos\left(4t + \frac{\pi}{2}\right) + 5 \cos\left(7t - \frac{2\pi}{3}\right) + 3 \sin 9t$$

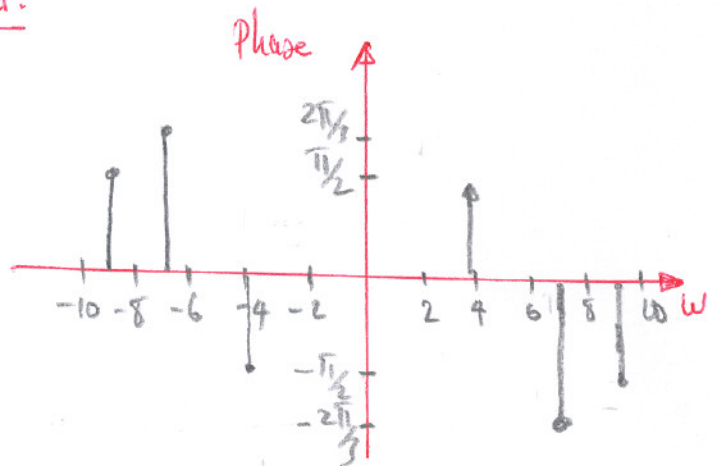
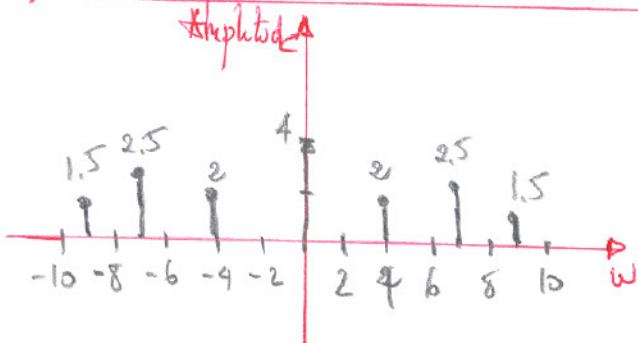
- Sketch the amplitude and phase spectra for the signal $g(t)$.
- Sketch the exponential Fourier series spectra.
- Write the exponential Fourier series for the signal $g(t)$.

$$g(t) = 4 + 4 \cos\left(4t + \frac{\pi}{2}\right) + 5 \cos\left(7t - \frac{2\pi}{3}\right) + 3 \sin\left(9t - \frac{\pi}{2}\right)$$

a) The amplitude and phase spectra for $g(t)$:



b) The exponential Fourier series spectra:



c) The exponential Fourier series for $g(t)$:

$$g(t) = 4 + 2 \left[e^{j(4t + \pi/2)} + e^{-j(4t + \pi/2)} \right] + \frac{5}{2} \left[e^{j(7t - 2\pi/3)} + e^{-j(7t - 2\pi/3)} \right] + \frac{3}{2} \left[e^{j(9t - \pi/2)} + e^{-j(9t - \pi/2)} \right]$$