You are allowed to use your books and notes. You must do your own work or you will receive no points. You have 20 minutes to do this quiz.

1) (4 points) Draw the convolution between the following two signals.

![Convolution Graph](image1)

2) (4 points) Consider the signal \( f(t) = \cos\left(3t + \frac{\pi}{2}\right) + \sin\left(5t + \frac{\pi}{2}\right) \). Draw the magnitude and phase spectrums.

![Magnitude and Phase Graph](image2)

3) (2 points) What is the energy of the following periodic signal?

\[
x(t) = 3 - 2\cos(6t) + \pi\sin(9t)
\]

The fundamental frequency is the greatest common divisors of all frequencies which is 3 rad/s. The Fourier series representation is \( x(t) = 3\exp(j0t) - \exp(-j6t) - \exp(j6t) - \frac{j\pi}{2}\exp(j9t) + \frac{j\pi}{2}\exp(-j9t) \). The energy is just the sum of the magnitude square of the coefficients = \(11 + \frac{\pi^2}{2}\)