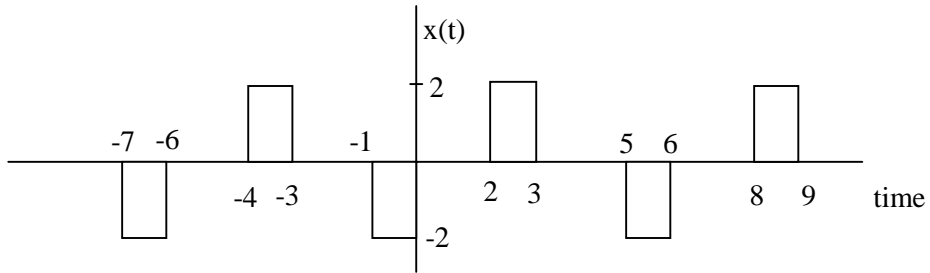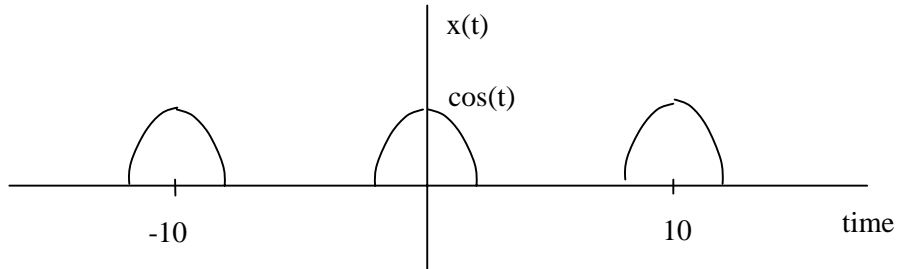Fourier Series

1. For the following signal:

a) Find the Fourier series
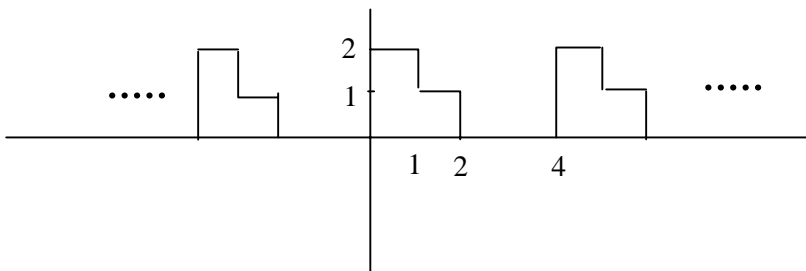b) Plot the spectra versus frequency, $\omega = n\omega_0$.

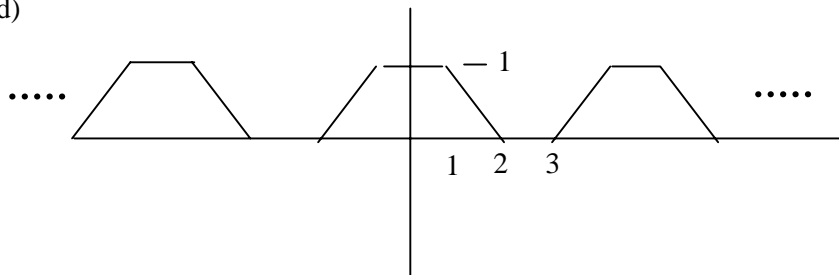2. Repeat problem 1 for the following signal:

3. Compute the Fourier series for the following signals:

a) $x(t) = 2 + 4\cos(50t + \pi/2) + 12\cos(100t - \pi/3)$
b) $x(t) = 4\cos(2\pi(1000)t)\cos(2\pi750000t)$
c)

d)

4. For the signals given in Problem 3c) and 3 d), use Matlab to plot the truncated Fourier series for N = 3, N = 10 and N= 40. (Use subplot to save paper).

5. Find the Fourier series for the following signal. Also, sketch the approximation if a large number of terms are kept in the series (say N=30).