MATH 416, HW 3

1. Implement in Matlab the 32×32 DFT as a matrix multiplication. Apply it to the following vectors: $v_1(k) = \sin(2\pi k/32), k = 0, \ldots, 31$, $v_2(k) = \sin(4\pi k/32), k = 0, \ldots, 31$, $v_3(k) = \cos(2\pi k/32), k = 0, \ldots, 31$. Plot the results in form of a function graph. Draw conclusions.

2. Implement in Matlab the 32×32 DFT by means of FFT algorithm. Apply it to the following vectors: $v_1(k) = \sin(2\pi k/32), k = 0, \ldots, 31$, $v_2(k) = \sin(4\pi k/32), k = 0, \ldots, 31$, $v_3(k) = \cos(2\pi k/32), k = 0, \ldots, 31$. Plot the results in form of a function graph. Draw conclusions.