MATH 416, HW 3

1. Find the Lagrange polynomial through the points (1, 2), (2; 5), (3; 4).

2. Find the expansion in Chebyshev polynomials $T_0(x), T_1(x), T_2(x)$ of the function $f(x) = 1 + x^2$ defined for $x \in [-1, 1]$.

3. Implement in Matlab the Chebyshev evaluation of polynomials, and solve problem 2 numerically.

4. Suppose that $f(x) = c$ is a constant function. Show that for any sampling of $f$, the piecewise linear approximation exactly equals $f$. 