

MATH 416, HW 4

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