

KTH, Matematik, Maurice Duits

SF2795 Fourier Analysis
Homework Assignment for Lecture 15

1. (3.9.1) Deduce from the Szász Müntz Theorem that the power $x^{n_k} : k \geq 1$, augmented by $x^0 = 1$, span $C([0, 1])$ iff $\sum n_k^{-1} = \infty$; "span" is understood to mean that

$$\inf \left\| f - c_0 - \sum_k C_j x^{n_k} \right\|_{\infty} = 0$$

for every $f \in C([0, 1])$. *Hint* $\|f\|_{\infty} \leq \|f'\|_2$ for smooth functions vanishing at $x = 0$.