PROBLEM SET # 1
MATH 251

Due September 6.

1. Lam: section 1, Problems 1,4,9,12,19.

2. Let k be a field and

$$T = \{(x, y) \in \mathbb{R}^2 \mid x < y\}.$$

Let R be the set of functions $f : T \to k$ with final support, i.e. $f(x, y) \neq 0$ for finitely many $(x, y) \in T$. Check that R with operations of pointwise addition and multiplication defined by

$$fg(x, y) = \sum_{x<z<y} f(x, z)g(z, y)$$

is a non-commutative ring without identity element and show that R does not have a proper maximal left ideal.