

**Problem set for
Quantum Groups and Noncommutative Geometry**

- (17) Determine the coendomorphism bialgebra of A from problem 13.
- (18) (*) Determine explicitly the dual coalgebra A^* of $A := \mathbb{K}\langle x, y \rangle / I$ where the ideal I is generated as a two-sided ideal by the polynomials
- $$xy - q^{-1}yx, x^2, y^2.$$
- (19) (*) Determine the coendomorphism bialgebra of A from problem 18.
- (20) Let H be a bialgebra and $S \in \text{Hom}(H, H)$. Then S is an antipode for H (and H is a Hopf algebra) iff S is a two sided inverse for id in the algebra $(\text{Hom}(H, H), *, \eta\varepsilon)$ (see [AdvAlgebra] Proposition 2.21). In particular S is uniquely determined.

Due date: Tuesday, 28.05.2002, 16:15 in Lecture Hall E41