

QUIZ 3

Instructions: Please write your name at the top of the page. Show all your work and explain your reasoning unless otherwise indicated.

- (a) (10 points). Let $\mathbf{Op}_{\mathbb{K}}$ be the category whose objects are pairs (V, T) where V is a $\mathbb{K}$ -vector space and $T : V \rightarrow V$ is a $\mathbb{K}$ -linear map, and whose morphisms $\phi : (V, T) \rightarrow (W, S)$ are linear maps $\phi : V \rightarrow W$ such that $\phi \circ T = S \circ \phi$. (We call such a map ϕ an *intertwining map*.) Prove that $\mathbf{Op}_{\mathbb{K}}$ and $\mathbb{K}[x]\text{-}\mathbf{Mod}$ are isomorphic categories.