Quiz 3

Name:

Winter 2011 Math 765

Consider the function $f : \mathbb{R}^2 \to \mathbb{R}^2$ given by

$$f(x, y) = (x^2 + y, x + y^2)$$

For which points $(x, y) \in \mathbb{R}^2$ is the map

$$f_\star : T_{(x,y)}\mathbb{R}^2 \to T_{(x^2+y, x+y^2)}\mathbb{R}^2$$

an injective linear map? A surjective linear map? An isomorphism of vector spaces?

Solution