Exercises

[1TD]Prerequisites:[14W].Note:*written exam, June 23th, 2012.*

Let f be a C^1 class function on $\mathbb{R}$, with $f(0) \neq 0$. Prove that $x \in \mathbb{R}$ exists such that the two vectors

$$v = (x, f(x)) \quad , \quad w = (-f'(x), 1)$$

are linearly dependent. (Note that the vector w is orthogonal to the tangent of the graph of f.) Discuss the possibility that this condition is verified for every $x \in \mathbb{R}$.

Solution 1. *[1TF]*