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Problem to Mathematics Magazine

Does exist no constants function $f : \mathbb{R} \rightarrow \mathbb{R}$, that
 $f(x) + f(2x) = (x + 1)f(f(x))$ for all real x ?

Solution :

Yes . Example :

$$f(x) = \begin{cases} -3 & \text{for } x = 2^k , \text{ where } k = 2m , m - \text{integer} \\ 3 & \text{for } x = 2^k , \text{ where } k = 2m + 1 , m - \text{integer} \\ 0 & \text{for other } x \end{cases}$$

Best wishes

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