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Title: Conditional equations for monomial functions

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In the first part of this paper, we consider monomial functions f of degree $n \in \mathbb{N}$ that satisfy the additional equation $y^n f(x) = x^n f(y)$ under the condition $y = a_m x^m + a_{m-1} x^{m-1} + \dots + a_1 x + a_0$, $m \in \mathbb{N}$, with $a_i \in \mathbb{R}$, $i = 0, \dots, m$ and $a_m \neq 0$, $a_0 \neq 0$. We prove that $f(x) = x^n f(1)$ for all $x \in \mathbb{R}$. In the second part, we consider monomial functions f of degree 3 that satisfy the additional equation $f(x^m) = x^{3(m-1)} f(x)$ with $|m| \geq 2$, $m \in \mathbb{Z}$. We prove that $f(x) = x^3 f(1)$ for all $x \in \mathbb{R}$. Counterexamples are presented for the case $m = -1$ in a general context.

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