

## Conditional equations for monomial functions

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**Abstract.** 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  $y = a_m x^m + a_{m-1} x^{m-1} + \cdots + a_1 x + a_0$ ,  $m \in \mathbb{N}$ , 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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