Title: A regularity condition for quadratic functions involving the unit circle

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We prove that if $f \colon \mathbb{R} \to \mathbb{R}$ is additive or quadratic and the mapping $\mathbb{R}^2 \ni (x, y) \to f(x)f(y)$ is bounded on a non-degenerated arc of the unit circle, then f is continuous, i.e. $f(x) = cx$ for all $x \in \mathbb{R}$ or $f(x) = cx^2$ for all $x \in \mathbb{R}$, respectively, with some real coefficient c.

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