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Title: On a functional equation with a symmetric component

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Let $I \subset \mathbb{R}$ be a nonvoid open interval and $r \neq 0, 1$, $q \in (0, 1)$, such that $r \neq q$, $r \neq \frac{1}{2}$ and $q \neq \frac{1}{2}$. In this paper we give all the functions $f, g : I \rightarrow \mathbb{R}_+$ such that

$$f\left(\frac{x+y}{2}\right)[r(1-q)g(y) - (1-r)qg(x)] = \frac{r-q}{1-2q}[(1-q)f(x)g(y) - qf(y)g(x)]$$

for all $x, y \in I$.

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