Exact Solutions > Functional Equations > Nonlinear Functional Equations with Several Independent Variables > Exponential Cauchy Equation

1. $f(x + y) = f(x)f(y)$.

Exponential Cauchy equation.

Solution:

$$f(x) = e^{Cx},$$

where C is an arbitrary constant. Furthermore, the function $f(x) \equiv 0$ is also a solution.

References

Fikhtengol'ts, G. M., *A Course of Differential and Integral Calculus, Vol. 1* [in Russian], Nauka, Moscow, 1969 (pages 158, 159).

Aczél, J. and Dhombres, J., *Functional Equations in Several Variables*, Cambridge Univ. Press, Cambridge, 1989.

Polyanin, A. D. and Manzhirov, A. V., *Handbook of Integral Equations: Exact Solutions (Supplement. Some Functional Equations)* [in Russian], Faktorial, Moscow, 1998.

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