Exact Solutions > Functional Equations > Nonlinear Functional Equations with Several Independent Variables > Equation of the Theory Probability

5. $f(x + y) = f(x) + f(y) - af(x)f(y),$ $a \neq 0.$

Equation of the theory probability (for $a = 1$).

Solution:

$$f(x) = \frac{1}{a}\left(1 - e^{-\beta x}\right),$$

where β is an arbitrary constant.

References

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

Kultti, K., Private communication, April 2003.

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