



Exact Solutions > Functional Equations > Linear Functional Equations with Several Independent Variables > Homogeneity Equation

12. $f(ax, ay) = a^\beta f(x, y)$.

Homogeneity equation. Here, a is an arbitrary number ($a \neq 0$) and β is some constant.

Solution:

$$f(x, y) = x^\beta \Phi(y/x),$$

where $\Phi(x)$ is an arbitrary function.

References

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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