10. $f(x,y)f(y,z) = f(x,z)$.

Solution:

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

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

References

Mathematical Encyclopedia, Vol. 5 [in Russian], Sovetskaya Entsiklopediya, Moscow, 1985 (page 700).

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.

Copyright © 2004 Andrei D. Polyanin