15. $y(x)y\left(\dfrac{a-x}{1+bx}\right) = f^2(x).$

The right-hand side function is assumed to satisfy the condition $f(x) = \pm f\left(\dfrac{a-x}{1+bx}\right)$. To be specific, we take $f(x) = f\left(\dfrac{a-x}{1+bx}\right)$.

Solution:

$$y(x) = \pm f(x) \exp\left[\Phi\left(x, \frac{a-x}{1+bx}\right)\right],$$

where $\Phi(x, z) = -\Phi(z, x)$ is any antisymmetric function of two arguments.

Reference

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

