

33.
$$y(x) + cy\left(\frac{bx+\beta}{a-x}\right) = f(x)$$
, $\beta = a^2 + ab + b^2$.

This is a special case of equation 11 in Subsection 1.2.

Reference

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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http://eqworld.ipmnet.ru/en/solutions/fe/fe1133.pdf