

9.
$$y(x) + \int_a^x f(t, y(t)) dt = g(x)$$
.

The solution of this integral equation is determined by the solution of the first-order ordinary differential equation

$$y'_x + f(x, y) - g'_x(x) = 0$$

under the initial condition y(a) = g(a).

Reference

Polyanin, A. D. and Manzhirov, A. V., Handbook of Integral Equations, CRC Press, Boca Raton, 1998.

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