

**Golovach, G. P.**

**Solution of Schlömilch integral equation.** (Ukrainian) Zbl 0932.45008

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The Schlömilch integral equation

$$f(x) = \frac{2}{\pi} \int_0^{\pi/2} \varphi(x \sin \theta) d\theta$$

is considered. An effective method of solution of this equation and its generalizations are proposed. It is proved that if a continuous solution  $\varphi$  of the equation (1) exists and the function  $f$  is continuous in the corresponding domain, then the solution of equation (1) is given by the formula

$$\varphi(t) = \operatorname{sgn}\{t\} \frac{d}{dt} \int_0^t \frac{x f(x) dx}{\sqrt{t^2 - x^2}}; \quad t \neq 0.$$

The corresponding formula for the equation

$$f(x) = \frac{2}{\pi} \int_0^{\pi/2} \varphi(x \sin^\alpha \theta) d\theta, \quad \alpha > 0,$$

is obtained, too.

Reviewer: O.A.Voina (Kyïv)

**MSC:**

[45G10](#) Other nonlinear integral equations

[45H05](#) Integral equations with miscellaneous special kernels

**Keywords:**

explicit solution formula; Schlömilch integral equation; continuous solution