

30.
$$\int_a^x J_0(\lambda \sqrt{x-t}) y(t) dt = f(x).$$

Here, $J_{\nu}(z)$ is the Bessel function of the first kind and f(a) = 0.

Solution:

$$y(x) = \frac{d^2}{dx^2} \int_a^x I_0(\lambda \sqrt{x-t}) f(t) dt.$$

Reference

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

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