



31.
$$\int_a^x I_0(\lambda(x-t))y(t) dt = f(x).$$

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

Solution:

$$y(x) = \frac{1}{\lambda} \left(\frac{d^2}{dx^2} - \lambda^2 \right)^2 \int_a^x (x-t) I_1(\lambda(x-t)) f(t) dt.$$

Reference

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