



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.