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

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

　　Solution:

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

Reference

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