



1. $\int_a^b |x-t| y(t) dt = f(x), \quad 0 \leq a < b < \infty.$

Solution:

$$y(x) = \frac{1}{2} f''_{xx}(x).$$

The right-hand side $f(x)$ of the integral equation must satisfy certain relations. The general form of $f(x)$ is as follows:

$$f(x) = F(x) + Ax + B,$$
$$A = -\frac{1}{2} [F'_x(a) + F'_x(b)], \quad B = \frac{1}{2} [aF'_x(a) + bF'_x(b) - F(a) - F(b)],$$

where $F(x)$ is an arbitrary bounded twice differentiable function (with bounded first derivative).

Reference

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