2. $y(x) + A\int_a^b |x-t|\,y(t)\,dt = f(x).$

1°. For $A<0$, the solution is given by

$$y(x) = C_1\cosh(kx) + C_2\sinh(kx) + f(x) + k\int_a^x \sinh[k(x-t)]f(t)\,dt, \quad k=\sqrt{-2A}, \qquad (1)$$

where the constants C_1 and C_2 are determined by conditions:

$$\begin{gathered} y'_x(a) + y'_x(b) = f'_x(a) + f'_x(b), \\ y(a) + y(b) + (b-a)y'_x(a) = f(a) + f(b) + (b-a)f'_x(a). \end{gathered} \qquad (2)$$

For $A>0$, the solution is given by

$$y(x) = C_1\cos(kx) + C_2\sin(kx) + f(x) - k\int_a^x \sin[k(x-t)]f(t)\,dt, \quad k=\sqrt{2A}, \qquad (3)$$

where the constants C_1 and C_2 are determined by conditions (2).

3°. In the special case $a=0$ and $A>0$, the solution of the integral equation is given by formula (3) with

$$C_1 = k\frac{I_s(1+\cos\lambda) - I_c(\lambda+\sin\lambda)}{2+2\cos\lambda+\lambda\sin\lambda}, \qquad C_2 = k\frac{I_s\sin\lambda + I_c(1+\cos\lambda)}{2+2\cos\lambda+\lambda\sin\lambda},$$
$$k=\sqrt{2A}, \quad \lambda = bk, \quad I_s = \int_0^b \sin[k(b-t)]f(t)\,dt, \quad I_c = \int_0^b \cos[k(b-t)]f(t)\,dt.$$

Reference

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

