



7.
$$\int_{-\infty}^{\infty} \frac{a + b \operatorname{sign}(x - t)}{|x - t|^{1-\lambda}} y(t) dt = f(x), \quad 0 < \lambda < 1.$$

Solution:

$$y(x) = \frac{\lambda \sin(\pi \lambda)}{4\pi [a^2 \cos^2(\frac{1}{2}\pi \lambda) + b^2 \sin^2(\frac{1}{2}\pi \lambda)]} \int_{-\infty}^{\infty} \frac{a + b \operatorname{sign}(x - t)}{|x - t|^{1+\lambda}} [f(x) - f(t)] dt.$$

References

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

Samko, S. G., Kilbas, A. A., and Marichev, O. I., *Fractional Integrals and Derivatives. Theory and Applications*, Gordon & Breach Sci. Publ., New York, 1993.