

9.
$$y(x) + A \int_a^x \left[e^{\lambda(x-t)} - 1\right] y(t) dt = f(x)$$
.

1°. Solution for $D \equiv \lambda(\lambda - 4A) > 0$:

$$y(x) = f(x) - \frac{2A\lambda}{\sqrt{D}} \int_{a}^{x} R(x - t)f(t) dt, \qquad R(x) = \exp\left(\frac{1}{2}\lambda x\right) \sinh\left(\frac{1}{2}\sqrt{D}x\right).$$

 2° . Solution for $D \equiv \lambda(\lambda - 4A) < 0$:

$$y(x) = f(x) - \frac{2A\lambda}{\sqrt{|D|}} \int_{a}^{x} R(x - t)f(t) dt, \qquad R(x) = \exp\left(\frac{1}{2}\lambda x\right) \sin\left(\frac{1}{2}\sqrt{|D|} x\right).$$

 3° . Solution for $\lambda = 4A$:

$$y(x) = f(x) - 4A^2 \int_a^x (x - t) \exp[2A(x - t)] f(t) dt.$$

Reference

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

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