

3.
$$y(x) + \lambda \int_a^x (x-t)^2 y(t) dt = f(x)$$
.

Solution:

$$y(x) = f(x) - \int_{a}^{x} R(x - t)f(t) dt,$$

where

$$R(x) = \frac{2}{3}ke^{-2kx} - \frac{2}{3}ke^{kx} \left[\cos(\sqrt{3}kx) - \sqrt{3}\sin(\sqrt{3}kx)\right], \qquad k = \left(\frac{1}{4}\lambda\right)^{1/3}.$$

Reference

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

Copyright © 2004 Andrei D. Polyanin

http://eqworld.ipmnet.ru/en/solutions/ie/ie0203.pdf