

16.
$$y(x) - \int_{-\infty}^{\infty} K(x-t)y(t) dt = f(x)$$
.

The Fourier transform is used to solve this equation.

Solution:

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

where

$$R(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} \widetilde{R}(u) e^{iux} \, du, \quad \ \widetilde{R}(u) = \frac{\widetilde{K}(u)}{1 - \sqrt{2\pi}} \, \widetilde{K}(u), \quad \ \widetilde{K}(u) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} K(x) e^{-iux} \, dx.$$

References

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