



32. $y''_{xx} + ay'_x + (be^{\lambda x} + c)y = 0.$

Solution:

$$y = e^{-ax/2} [C_1 J_\nu(2\lambda^{-1}\sqrt{b} e^{\lambda x/2}) + C_2 Y_\nu(2\lambda^{-1}\sqrt{b} e^{\lambda x/2})], \quad \nu = \lambda^{-1}\sqrt{a^2 - 4c},$$

where C_1 and C_2 are arbitrary constants, $J_\nu(z)$ and $Y_\nu(z)$ are the Bessel functions.

References

- Kamke, E.**, *Differentialgleichungen: Lösungsmethoden und Lösungen, I. Gewöhnliche Differentialgleichungen*, B. G. Teubner, Leipzig, 1977.
- Polyanin, A. D. and Zaitsev, V. F.**, *Handbook of Exact Solutions for Ordinary Differential Equations, 2nd Edition*, Chapman & Hall/CRC, Boca Raton, 2003.