



7. $x^2 y'''' + 6xy''' + 6y'' - a^2 y = 0.$

Equation of transverse vibrations of a pointed bar.

Solution:

$$y = \frac{1}{\sqrt{x}} [C_1 J_1(2\sqrt{ax}) + C_2 Y_1(2\sqrt{ax}) + C_3 I_1(2\sqrt{ax}) + C_4 K_1(2\sqrt{ax})],$$

where $J_1(z)$ and $Y_1(z)$ are the Bessel functions, and $I_1(z)$ and $K_1(z)$ are the modified Bessel functions.

References

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