



8. $xy''_{xx} + ny'_x + bx^{1-2n}y = 0.$

1°. Solution for $n = 1$:

$$y = C_1|x|^{k_1} + C_2|x|^{k_2},$$

where C_1 and C_2 are arbitrary constants, k_1 and k_2 are roots of the quadratic equation $k^2 + (n-1)k + b = 0$.

2°. Solution for $n \neq 1$:

$$y = \begin{cases} C_1 \sin\left(\frac{\sqrt{b}}{n-1}x^{1-n}\right) + C_2 \cos\left(\frac{\sqrt{b}}{n-1}x^{1-n}\right) & \text{if } b > 0, \\ C_1 \exp\left(\frac{\sqrt{-b}}{n-1}x^{1-n}\right) + C_2 \exp\left(\frac{-\sqrt{-b}}{n-1}x^{1-n}\right) & \text{if } b < 0. \end{cases}$$

References

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