

38. $yy_{xx}'' + a(y_x')^2 + f(x)yy_x' + g(x)y^2 = 0$. The substitution $w = y^{a+1}$ leads to a linear equation: $w_{xx}'' + f(x)w_x' + (a+1)g(x)w = 0$.

Reference

Polyanin, A. D. and Zaitsev, V. F., Handbook of Exact Solutions for Ordinary Differential Equations, 2nd Edition, Chapman & Hall/CRC, Boca Raton, 2003.

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