

11.
$$F\left(e^{\alpha x}y^m, \frac{y'_x}{y}, \frac{y''_{xx}}{y}, \dots, \frac{y_x^{(n)}}{y}\right) = 0.$$

Equation invariant under "translation—dilatation" transformation. The transformation $z = e^{\alpha x} y^m$, $w = y'_x/y$ leads to an (n-1)st-order equation.

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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