

46. $y_{xx}'' = xf(y)(y_x')^3$.

Taking y to be the independent variable, we obtain a linear equation with respect to x = x(y): $x''_{yy} = -f(y)x$.

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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http://eqworld.ipmnet.ru/en/solutions/ode/ode0346.pdf