

4. $y_{xx}'' = f(ay + bx + c)$.

The substitution w = ay + bx + c leads to an autonomous equation of the form 3.1: $w''_{xx} = af(w)$.

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/ode0304.pdf