



11. $y''_{xx} = y^{-3} f\left(\frac{y}{\sqrt{ax^2 + bx + c}}\right).$

Setting $u(x) = y(ax^2 + bx + c)^{-1/2}$ and integrating the equation, we obtain a first-order separable equation:

$$(ax^2 + bx + c)^2 (u'_x)^2 = \left(\frac{1}{4}b^2 - ac\right)u^2 + 2 \int u^{-3} f(u) du + C_1.$$

Reference

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