



47.  $y''_{xx} = f(y)(y'_x)^2 + g(x)y'_x$ .

Dividing by  $y'_x$ , we obtain an exact differential equation. Its solution follows from the equation:

$$\ln |y'_x| = \int f(y) dy + \int g(x) dx + C.$$

Solving the latter for  $y'_x$ , we arrive at a separable equation. In addition,  $y = C_1$  is a singular solution, with  $C_1$  being an arbitrary constant.

### Reference

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