

45. 
$$y''_{xx} + f(y)(y'_x)^2 - \frac{1}{2}y'_x = e^x g(y)$$
.

The substitution  $w(y) = e^{-x}(y_x')^2$  leads to a first-order linear equation:  $w_y' + 2f(y)w = 2g(y)$ .

## 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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