

45. 
$$y'_x = e^{\alpha x - \beta y} f(ae^{\alpha x} + be^{\beta y}).$$

The substitution  $w=ae^{\alpha x}+be^{\beta y}$  leads to a separable equation:  $w_x'=e^{\alpha x}[a\alpha+b\beta f(w)].$ 

## 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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