

First-Order Partial Differential Equations > Quasilinear Equations > Section 2.1

$$10. \quad ae^{\lambda x}\frac{\partial w}{\partial x} + be^{\beta y}\frac{\partial w}{\partial y} = f(w).$$

General solution:

$$\int \frac{dw}{f(w)} = -\frac{1}{a\lambda} e^{-\lambda x} + \Phi(u), \qquad u = a\lambda e^{-\beta y} - b\beta e^{-\lambda x},$$

where $\Phi(u)$ is an arbitrary function.

Reference

Polyanin, A. D., Zaitsev, V. F., and Moussiaux, A., Handbook of First Order Partial Differential Equations, Taylor & Francis, London, 2002.

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http://eqworld.ipmnet.ru/en/solutions/fpde/fpde2110.pdf