

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

12.
$$f(x)\frac{\partial w}{\partial x} + g(y)\frac{\partial w}{\partial y} = h(w)$$
.

General solution:

$$\int \frac{dw}{h(w)} = \int \frac{dx}{f(x)} + \Phi(u), \qquad u = \int \frac{dx}{f(x)} - \int \frac{dy}{g(y)},$$

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/fpde2112.pdf