

First-Order Partial Differential Equations > Linear Equations > Section 1.3

9.
$$f(x)\frac{\partial w}{\partial x} + g(y)\frac{\partial w}{\partial y} = [h_1(x) + h_2(y)]w$$
.

General solution:

$$w = \exp \left[\int \frac{h_1(x)}{f(x)} \; dx + \int \frac{h_2(y)}{g(y)} \; dy \right] \Phi \left(\int \frac{dx}{f(x)} \; dx - \int \frac{dy}{g(y)} \; dy \right),$$

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/fpde1309.pdf