

First-Order Partial Differential Equations > Nonlinear Equations > Section 3.3

3.
$$\frac{\partial w}{\partial x} + f\left(\frac{\partial w}{\partial y}\right) = g(x)y + h(x)$$
.

Complete integral:

$$w = \varphi(x)y + \int \left[h(x) - f\left(\varphi(x)\right)\right] dx + C_1, \quad \text{where} \quad \varphi(x) = \int g(x) \, dx + C_2,$$

 C_1 and C_2 are arbitrary constants.

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/fpde3303.pdf