

First-Order Partial Differential Equations > Nonlinear Equations > Section 3.1

3.
$$\frac{\partial w}{\partial x} + a \left(\frac{\partial w}{\partial y}\right)^2 = f(x) + g(y)$$
.

Complete integral:

$$w = -C_1 x + \int f(x) dx + \int \sqrt{\frac{g(y) + C_1}{a}} dy + C_2,$$

where 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/fpde3103.pdf