

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

9. 
$$\frac{\partial w}{\partial x} + a\left(\frac{\partial w}{\partial y}\right)^2 + b\frac{\partial w}{\partial y} = f(x)y + g(x)$$
.

Complete integral:

$$w = \varphi(x)y + \int \left[g(x) - a\varphi^2(x) - b\varphi(x)\right] dx + C_1, \quad \text{where} \quad \varphi(x) = \int f(x) dx + C_2,$$

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/fpde3109.pdf