

First-Order Partial Differential Equations > Nonlinear Equations > Section 3.2

11.
$$\left(\frac{\partial w}{\partial x}\right)^2 + f(w)\left(\frac{\partial w}{\partial y}\right)^2 = g(w)$$
.

Complete integral in implicit form:

$$\int \sqrt{\frac{C_1^2 + C_2^2 f(w)}{g(w)}} \, dw = C_1 x + C_2 y + C_3,$$

where C_1 , C_2 , and C_3 are arbitrary constants (one of the constants C_1 or C_2 can be set equal to ± 1).

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/fpde3211.pdf