First-Order Partial Differential Equations > Quasilinear Equations > Section 2.1

8. $\quad ax^n \dfrac{\partial w}{\partial x} + by^k \dfrac{\partial w}{\partial y} = f(w).$

General solution:

$$\int \frac{dw}{f(w)} = \frac{1}{a(1-n)} x^{1-n} + \Phi(u), \quad \text{where} \quad u = \frac{1}{a(1-n)} x^{1-n} - \frac{1}{b(1-k)} y^{1-k},$$

$\Phi(u)$ 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.

http://eqworld.ipmnet.ru/en/solutions/fpde/fpde2108.pdf