



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

$$7. \quad ay \frac{\partial w}{\partial x} + bx \frac{\partial w}{\partial y} = f(w).$$

General solution for $ab > 0$:

$$\int \frac{dw}{f(w)} = \frac{1}{\sqrt{ab}} \ln |\sqrt{ab} x + ay| + \Phi(ay^2 - bx^2),$$

where $\Phi(u)$ 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.