



First-Order Partial Differential Equations > Linear Equations > Section 1.1

$$11. \quad x \frac{\partial w}{\partial x} + f(x^n e^{\alpha y}) \frac{\partial w}{\partial y} = 0.$$

1°. Principal integral: $\Xi = \int \frac{dv}{v[n + \alpha f(v)]} - \ln|x|$, where $v = x^n e^{\alpha y}$.

2°. General solution: $w = \Phi(\Xi)$, where $\Phi(\Xi)$ 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.