

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

10.
$$\frac{\partial w}{\partial x} + y f(e^{\alpha x} y^m) \frac{\partial w}{\partial y} = 0.$$

- $1^{\circ}. \ \ \text{Principal integral:} \quad \Xi = \int \frac{dv}{v \left[\alpha + m f(v)\right]} x, \ \ \text{where} \ v = e^{\alpha x} y^m.$
- 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.

Copyright © 2004 Andrei D. Polyanin

http://eqworld.ipmnet.ru/en/solutions/fpde/fpde1110.pdf