

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

8. 
$$\frac{\partial w}{\partial x} + f\left(\frac{y}{x}\right) \frac{\partial w}{\partial y} = 0.$$

- 1°. Principal integral:  $\Xi = \int \frac{dv}{f(v) v} \ln |x|$ , where  $v = \frac{y}{x}$ .
- $2^{\circ}$ . 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.

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http://eqworld.ipmnet.ru/en/solutions/fpde/fpde1108.pdf