



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

1. 
$$\frac{\partial w}{\partial x} + [f(x)y + g(x)] \frac{\partial w}{\partial y} = 0.$$

1°. Principal integral:  $\Xi = e^{-F}y - \int e^{-F}g(x) dx$ , where  $F = \int f(x) dx$ .

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.