



First-Order Partial Differential Equations > Linear Equations > Section 1.2

5. 
$$\frac{\partial w}{\partial x} + a \frac{\partial w}{\partial y} = f(x)g(y).$$

General solution:

$$w = \int_{x_0}^x f(t)g(y - ax + at) dt + \Phi(y - ax),$$

where  $\Phi(u)$  is an arbitrary function and  $x_0$  may be taken arbitrary.

### Reference

**Polyanin, A. D., Zaitsev, V. F., and Moussiaux, A.,** *Handbook of First Order Partial Differential Equations*, Taylor & Francis, London, 2002.