

First-Order Partial Differential Equations > Nonlinear Equations > Section 3.3

21.
$$F\left(ax+by+cw, \frac{\partial w}{\partial x}, \frac{\partial w}{\partial y}\right)=0.$$

For c=0, see equation 3.3.19. If $c\neq 0$, then the substitution cu=ax+by+cw leads to an equation of the form 3.3.20: $F\left(cu,\frac{\partial u}{\partial x}-\frac{a}{c},\frac{\partial u}{\partial y}-\frac{b}{c}\right)=0$.

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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