



Exact Solutions > Ordinary Differential Equations > First-Order Ordinary Differential Equations > Generalized Homogeneous Differential Equation

$$29. \quad y'_x = \frac{y}{x} f(x^n y^m).$$

Generalized homogeneous differential equation. The substitution $z = x^n y^m$ leads to a separable equation: $xz'_x = nz + mz f(z)$.

References

Murphy, G. M., *Ordinary Differential Equations and Their Solutions*, D. Van Nostrand, New York, 1960.

Polyanin, A. D. and Zaitsev, V. F., *Handbook of Exact Solutions for Ordinary Differential Equations, 2nd Edition*, Chapman & Hall/CRC, Boca Raton, 2003.

Generalized Homogeneous Differential Equation