



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

5. $y'_x = f(y/x)$.

First-order homogeneous differential equation. The substitution $u(x) = y/x$ leads to a separable equation: $xu'_x = f(u) - u$.

References

- Kamke, E.**, *Differentialgleichungen: Lösungsmethoden und Lösungen, I, Gewöhnliche Differentialgleichungen*, B. G. Teubner, Leipzig, 1977.
- Boyce, W. E. and DiPrima, R. C.**, *Elementary Differential Equations, 7th Edition*, Wiley, New York, 2000.
- Polyanin, A. D. and Zaitsev, V. F.**, *Handbook of Exact Solutions for Ordinary Differential Equations, 2nd Edition*, Chapman & Hall/CRC, Boca Raton, 2003.

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