

Homework 7

Due March 7th by the beginning of class.

Problem: Let $\lambda \in \mathbb{C}$ and let $u \in \mathcal{D}'(\mathbb{R}^n)$ be homogeneous of degree λ in the sense of [FrJo, (4.2.12)]. Show that $\partial^\alpha u$ is homogeneous of degree $\lambda - |\alpha|$ for any multiindex α , and that

$$\sum_{j=1}^n x_j \partial_j u = \lambda u.$$

Hint: Differentiate [FrJo, (4.2.12)] with respect to t and set $t = 1$ (justifying carefully!).

Solution:

REFERENCES

[FrJo] G. Friedlander and M. Joshi. The Theory of Distributions, second edition, Cambridge University Press, 1998.