OPIAL’S INEQUALITY FOR ZERO–AREA CONSTRAINT

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Abstract. We prove that \( \int_0^1 |y y'| \leq \frac{1}{4} \int_0^1 y'^2 \) provided \( \int_0^1 y = 0 \). The nontrivial part is the sharp constant \( \frac{1}{4} \). Cases of equality can be abstracted from the proof. This is an (apparently much deeper) variant of a result by Opial, who proved the same estimate under Dirichlet boundary conditions on \( y \).

Key words and phrases: Opial inequality, sharp constants, rearrangement.

REFERENCES