

*Proposed problem to Mathematical Reflections*

**Statement**

Let  $f: [-1, 1] \rightarrow \mathbb{R}$  a function three times continuously differentiable such that  $f(-1) = f(1) = f''(-1) = 0$ . Prove that

$$\left( \int_{-1}^1 f(x) dx \right)^2 \leq \frac{104}{315} \int_{-1}^1 (f'''(x))^2 dx$$