

Evaluate It

Problem provided by the Editor

Let $g(x) = \ln x$. Find

$$\lim_{p \rightarrow 0} \left(\lim_{q \rightarrow 0} \left(\frac{g(27+27p+9p^2+p^3) - g(27)}{4pq} - \frac{12g(3+p+q) - 12(g(3+q))}{16pq} \right) \right)$$

The Problem Solving Competition uses problems submitted by professors and students for the monthly mail-out. If problems are submitted from your college by a professor and student, and if they are used in the competition, your mathematics department will receive FREE as a prize, wood-backed medallion. Send your original problem statements, and sketches to Professor Richard Neal, Editor *The Problem Solving Competition*, Box 60434, Oklahoma City, OK, 73146, USA.