

## Problem of the Week-4: A Complicated Looking Limit

(that simplifies nicely using the definition of derivative and some algebraic tricks)

Let  $g(x) = \ln(x)$ . Evaluate the limit.

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

Clearly show your steps

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<sup>1</sup>Posting Date 10/11/06. Submit solutions to Noah Aydin, RBH 319 (e-mail or hard-copy, but hard copy submissions must include a time stamp) by 4 pm on 10/20/06.