MATH 1101Y 2009 Quiz 9 (a)

1. (3 pts) Find an expression for the area under the graph of $f = x^4, 0 \leq x \leq 3$ as a limit. Do not evaluate the limit.

   *Solution*:

$$A = \lim_{n\to\infty} \sum_{i=1}^{n} \left(\frac{3i}{n}\right)^4 \cdot \left(\frac{3}{n}\right)$$

   or

$$A = \lim_{n\to\infty} \sum_{i=0}^{n-1} \left(\frac{3i}{n}\right)^4 \cdot \left(\frac{3}{n}\right)$$

□

2. (2 pts) Find the derivative of the function

$$g(x) = \int_1^{x^3} \frac{1}{t + t^5} dt.$$

   *Solution*:

$$g'(x) = \frac{1}{x^3 + x^{15}} \cdot 3x^2.$$

□