# Quiz 01

Oct 02, 2009.

1. Derive the integral form of Taylor's remainder term for $n = 2$, assuming the function under concern is in $C^\infty$.

2. Write down Taylor's polynomial $p_2(x, y, z)$ for $f(x, y, z)$ around the origin $(0, 0, 0)$, assuming $f \in C^\infty(R^3)$. That is, $f(x, y, z) = p_2(x, y, z) + R_2(x, y, z)$, degree of $p_2 = 2$. Write down $p_2$ (need NOT give $R_2$).

3. How many terms of Taylor polynomial are needed to approximate $e^x$ within $10^{-6}$ on $[-1, 1]$? Explain.

4. Evaluate
$$p(x) = 1 + \frac{x^4}{4!} + \frac{x^8}{8!} + \frac{x^{12}}{12!} + \frac{x^{16}}{16!}$$
as efficient as possible. You may give your answer either in the form of a loop, or any other expression as long as it is clear enough.

   How many multiplications are needed?

Numerical Analysis I, Fall 2009 (http://www.math.nthu.edu.tw/~ wangwc/)

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