

# 淡江大學 103 學年度碩士班招生考試試題

48  
49

系別：財金系、管科系

科目：微積分

考試日期：3月2日(星期日) 第2節

本試題共 10 大題，1 頁

There are 10 problems and 10 points each. Please answer all questions.

1. Let  $f(x) = \frac{x+3}{|x-6|^3}$ , find  $f'(3)$ .
2. Evaluate  $\lim_{x \rightarrow 5} \frac{\frac{1}{x} - \frac{1}{5}}{x-5}$ .
3. Assume  $y = \frac{u-1}{u+1}$  and  $u = x^2$ , then find  $\frac{dy}{dx}$  at  $x = 3$ .
4. Find the absolute maximum and absolute minimum of the function  $f(x) = x^3 - 3x^2 - 24x + 2, -3 \leq x \leq 4$ .
5. Find  $\int \frac{1}{\sqrt{1-x}} dx$ .
6. Find  $\int_{-5}^5 (|x|-1) dx$ .
7. Find  $\int_0^{\infty} x e^{-x} dx$ .
8. Find the Taylor series expansion of  $f(x) = e^{-x}$  in power of  $x+3$ .
9. Compute  $\int_{-1}^1 \int_0^{1-x} (2x+1) dy dx$ .
10. Find the stationary points of function  $f(x, y) = -x^4 - y^4 + 4xy$  and determine the relative maximum, relative minimum or saddle point.