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淡江大學九十三年學年度轉學生招生考試試題 7-1

系別：商管組二年級

科目：微 積 分

准帶項目請打「○」否則打「×」	
×	簡單型計算機

節次： 7 月 13 日 第 5 節

本試題共 1 頁

一. 填充題 (每小題 7 分, 共 70 分)

請按題號依序作答, 並註明題號. 只須寫答案, 不必寫出計算過程.

1. $\lim_{x \rightarrow 4^-} \frac{|x-4|}{x-4} = \underline{\hspace{2cm}}$

2. $\lim_{h \rightarrow 0} \frac{5^h - 1}{h} = \underline{\hspace{2cm}}$

3. $\frac{d}{dx} \frac{\ln(3x^2 + 5)}{7x^4 - 2x + 1} = \underline{\hspace{2cm}}$

4. $\frac{d}{dx} (5x)^{x-1} = \underline{\hspace{2cm}}$

5. $\frac{d}{dx} e^{-2 \sin x} \cdot \tan x = \underline{\hspace{2cm}}$

6. $\int_0^1 \frac{x+1}{e^{2x}} dx = \underline{\hspace{2cm}}$

7. $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \cos^3 4x \cdot \sin 4x dx = \underline{\hspace{2cm}}$

8. For the equation $4x^3y = 3 + y^3 - 6x^2 + 5xy^2$, the slope of the tangent line at the point (2, 3) is = $\underline{\hspace{2cm}}$.

9. For the function $f(x) = x^3 - 3x^2 - 24x + 27$ on the interval $[-1, 5]$, the absolute (global) maximum value is = $\underline{\hspace{2cm}}$.

10. The area between two curves $y = 1 - x$ and $y = e^x$ from $x = -1$ to $x = 4$ is = $\underline{\hspace{2cm}}$.

二. 計算題 (每小題 10 分, 共 30 分) 必須寫出計算過程, 否則不予計分.

1. Determine the improper integral $\int_{-\infty}^{\infty} \frac{x}{\sqrt{x^2+1}} dx$ is convergent or divergent.

2. Consider the function $f(x, y) = 16xy - x^4 - 2y^2$. Find all relative extrema and identify any saddle point.

3. Find the volume under the surface $f(x, y) = e^{-y^2}$ and over the domain D which is the region bounded by curves $y = x$, $x = 0$ and $y = 3$.