淡江大學 95 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「V」	
	簡單型計算機

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. Consider $f(x) = \begin{cases} 4x, & x \le 1 \\ 2x+1, & x > 1 \end{cases}$ Find $\lim_{x \to 1^-} f(x) =$ _____.

2. $\lim_{x \to 0} \dfrac{e^{-x} - e^{x}}{3x} =$ _____.

3. $\dfrac{d}{dx}\left[(3x^2+1)^4 + e^{-6x^2}\right]^3 =$ _____.

4. $\dfrac{d}{dx} e^{\cos x^2} =$ _____.

5. $\dfrac{d}{dx} (3x)^x =$ _____.

6. $\int \dfrac{(\ln 2x)^5}{x}\, dx =$ _____.

7. $\int_0^1 (e^{2x} - 2x)^2 (e^{2x} - 1)\, dx =$ _____.

8. $\int_0^{\frac{\pi}{2}} x \cos x\, dx =$ _____.

9. For the equation $x^2y^2 + 3x^3y - xy^4 - 14 = 0$, the slope of the tangent line at the point $(-1, 2)$ is = _____.

10. The area between two curves $y = 2x^2 + 3x - 2$ and $y = x + 2$ from $x = -1$ to $x = 2$ is = _____.

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 $\int_{-\infty}^{\infty} \dfrac{e^{x}}{(1+e^{x})^4}\, dx$ is convergent or divergent.

2. A motorcycle shop estimates that it will sell 750 motorbikes in a year. Each bike cost \$300, plus a fixed charge of \$400 per order. If it costs \$240 to store a motorbike for a year, what is the order size and how many orders will be needed in a year to minimize inventory costs?

3. Find the volume under the surface $f(x, y) = xe^{-y}$ over the region which is bounded by curves $y = 1 - x^2$, $x = 0$ and $y = 0$.